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PRINTED BY
BPCC, Colchester.

CPC ATTACK comes from HHL Publishing who publish far too many magazines to list here.

SPECIAL THANKS
To all the backroom boys who helped out and to everyone else that knows us.

CONTENTS

Is there something we should know? Need help on technical matters or games? Want to get something out in the open? Then you need a contact.

You can be certain of getting your enquiry answered within the magazine if you address your letter to the right person or department. We can't personally reply to enquiries, either by telephone or post, but, you can reach us by writing to or faxing the listed departments at:

CPC ATTACK!, HHL Publishing, Floor 3, Greater London House, Hampstead Road, London NW1 7QQ
or
FAX: 071-387 9518

P.S. If you have a problem with any advertising company in the magazine, you can always call our advertising department as long as it's between normal working hours. They are always available to help with your problems.

CPC Q&A
Always ready to answer your problems, the technical help section is crammed with helpful advice, tips and readers' problems. If you have any advice or handy tips to offer, send them in - prizes awarded for every tip.

LETTERS
If you ever feel the need to express yourself, want to tell the world how wonderful you are, how crap a program is or if you wish to join in the topical forum, then get scribbling.

SUBMISSIONS
We are always on the look-out for interesting and topical articles for publication. If you have a special set-up, or know of a special utility, you could write an article about it for CPC ATTACK. You could become a regular contributor, earning lots of money for your work.

PROGRAM LISTINGS
Listings and 10-Liners are superb learning ground for would-be programmers, and they also provide excellent utilities and games. In CPC ATTACK! all listings are treated as submissions and, as such, contributors are paid real cash. Please remember to include a disc or tape with the listing on it!

AMY'S PMT
Whether you want to give pokes, maps, tips (and cheats) or want to get some, this is the place to do it. Lotsa prizes to be won each and every month for the best submissions published.

CLASSIFIED
Not only for getting rid of your old equipment and grabbing a great bargain, but also for CPC contacts and user groups. The best way to sell your product.

COMPETITIONS
Lots and lots of COMPO's. That's what we'll be striving to offer. You can win quite easily, but you'll have to get your entry into the correct hat! Any competition wrongly addressed goes straight into the dustcart.

Don't put any letters or tips into a competition submission as we don't open them other than to check if a winner's answers are correct.

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CPC Attack!

Welcome to CPC ATTACK!

Welcome to the best CPC magazine in the universe. You may be on your hols to Mars, Saturn or wherever - you'll not want to miss Attack! and you've probably made arrangements for your Newsagents to keep you a copy.

We're just off on our hols now, but by the time you read this we'll be back in the office scribbling away! How's that? Well, as I write, my thoughts are with the Euro-championships - they start tonight! This is a few weeks ago - it just goes to show how long it takes to get the magazine into the shops!

I must thank all of the folk who have helped with their suggestions and tips. It's always hard finding a correct balance, especially with a new magazine in an established market. We think that we are getting there, and we're getting better each and every issue.

Well, it's goodbye from me and him and her, but until next time, enjoy the magazine and please don't hesitate to write in with any queries.



SERVICES





CONTENTS

REGULARS

SPECIALS

MEET AMY STRADAVARIUS

Amy has taken quite a battering from some of our older readers who don't like her and think she's "childish." However, plenty of our younger readers have kept her spirits up by being supportive in her hour of need

WIN! WIN! WIN! WIN! WIN! WIN! WIN! WIN!

COMPE

ENTRY FORM

All you have to do is to supply the correct title for the five screen shots shown.

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no later than 1st September 1992.

RULES

The judge's decision is final. The prize winners will be drawn from all entries whether correct or incorrect 4 weeks after the publication date. Only correct entries can win. In the event of an incorrect entry being drawn further entries will be drawn until a correct entry is found. It is not wise to submit other correspondance with competition entries (and vice-versa) as your envelope may not be opened at all! In the event of sponsors defaulting on prizes, replacement prizes of a similar value will be given. No cash alternatives may be offered. No written or verbal communication will be entered into, other than at the judge's discretion. Big, pink, long, and perfumed envelopes will be confiscated. Multiple entries are not allowed unless separate on genuine forms - no photocopies(for multiples only). The addresses of culprits found to be breaking any of the above rules will be compiled into a blacklist and sent to Readers Digest. They may also be punished with a free subscription to Amstrad Action.



B



A



C



D



WIN! WIN! WIN! WIN! WIN! WIN! WIN! WIN!

TITION!



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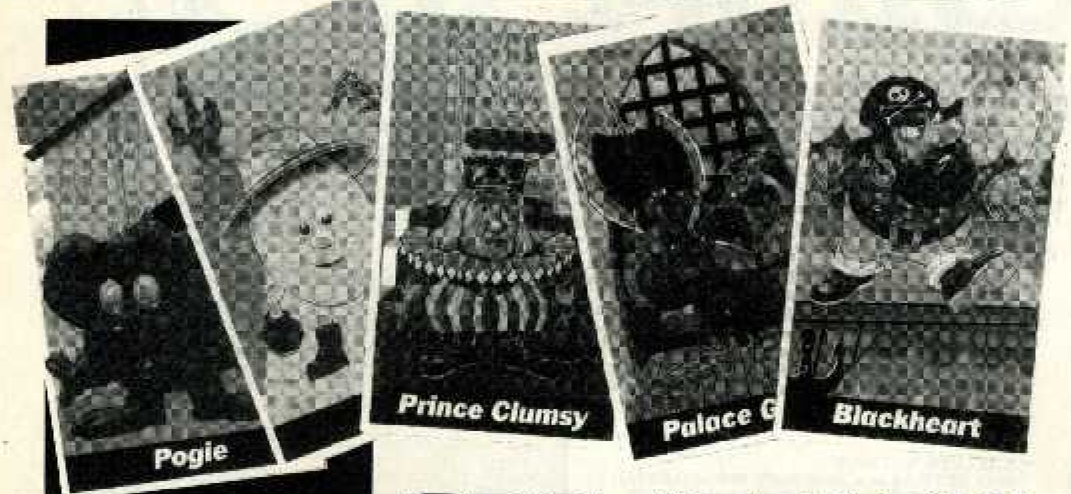
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NEWS



A CARD FOR ALL SEASONS

Buy any Codie game, and you should find that the generous souls have included a collector's Dizzy card. The Collect-o-cards feature full colour illustrations of bods from the Dizzy games with a quick character story on the B-side. There are 16 cards in the set, and it's likely that if you buy a lot of Codie games that you'll get duplicates - swap them with your friends or Codemasters can replace them for any other card of your choice.

CPC ATTACK! WHERE IS IT?

If you are one of the many readers who had to call us for a copy of Attack!, you'll be well aware that the magazine is selling faster than Willy Wonkas Chocolate Bars ever did! Copies disappeared from newsagents shelves so fast that many people still haven't seen that it's wickedly superior. As from this month, more copies will be on the shelves, but the safest way to get your copy is to reserve it from a local newsagent - use the form on the letters page. The newsagent should be able to order a copy for you every month.

The mini-survey is proving to be extremely useful. Just yesterday, there was a conundrum in the toilets - they ran out of toilet paper - but we were at hand to save the day with hundreds of dud surveys! We only sacrificed entries that showed a preference to WACCI! The rest were saved from sanitation and from them we took a few pointers. Watch out next month for more great improvements.



SNIPPETS

NEW LOW COST INKJET

If you are contemplating buying an inkjet printer then take a look at the Fujitsu B100. At £349 it is the same price as the Canon BJ10, but its specifications are slightly better.

Contact: Fujitsu Europe, 2 Longwalk Road, Stockley park, Uxbridge, Middlesex UB11 1AB. Tel: 081-573 4444.

CPC DOMAIN CHANGES HANDS

Simon Warford has taken over the running of ownership and editorship of the CPC Domain discmagazine from Alan Scully. The contact for the magazine is: John Fairlie, 20 Montague Road, Saltford, Bristol, Avon BS18 3LA.

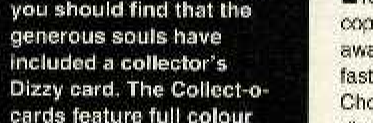
PAGEMAKER DELUXE

Pagemaker Deluxe, the upgraded version of Pagemaker, is being released for £2.95 plus disc and SAE.

Contact: Alan Scully, PO BOX 435, Glasgow G12 8SG.

LABEL DESIGNER

Alan Scully has been a tad busy recently, with upgrading older programs and now releasing Label Designer from which 3, 3.5 and 5.25in. disc labels and address labels can be designed. Graphics from Stop Press and Pagemaker Deluxe can be incorporated onto labels using the program. Label Designer costs a reasonable £2.50 plus disc and SAE.



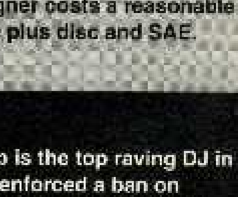
GRELL & FALLA

We mentioned this release in issue 1, and it's nearly-almost ready, but not quite. Next month, should see a review copy come our way. Until then be content with this: Grell and Fella have taken the job of cleaning up a sorceror's garden. The garden is full of creatures under an evil witch's influence. The creatures feed off the garden. Grell is a goblin and plants seeds which grow into luverly flowers. The creatures eat the flowers. Grell retaliates by bashing them. They don't do it no more. Parts of the garden have bad soil and seeds won't grow. Falla is a fairy and can fly, sprinkling special dust as she goes. The dust turns bad soil good enabling plants to grow. There are several garden areas to be resurrected. Dat's all folks!

DJ PUFF RAVES

Yep, Little Puff's back, but now grown up is the top raving DJ in the island. Big baddy, Captain Krip, has enforced a ban on ravers and confiscated DJ's record collection, scattering the discs across the island, protecting them with his guerrilla storm-trooper army.

DJ ain't taking no crap from the captain and sets out to recover the collection to allow him to restart the raves.



DJ Puff is cute, cuddly and nasty, a bit like New Zealand Story with a sting, but you'll have to wait till next month for a review.

Contact: Codemasters, 0926 814132

KNOW SOMETHING WE DON'T? PHONE 071-388 3171 and ask for the ATTACK! HOTLINE

Contact: Alan Scully, PO BOX 435, Glasgow G12 8SG.

FIRMWARE GUIDE

As Amstrad no longer support the CPC, this guide is a godsend to programmers and hackers who wish to get more out of their machines. The firmware guide highlights lots of useful info, such as memory maps, descriptions of firmware calls, disc and tape systems and lots more teccy jargon-busting explanations. The guide is supplied separately for £4.50, with a tape for £6.75, or with a disc for £8.75. The tape/disc contains several routines to help with machine coders - a memory editor, assembler, etc.

Contact: PRINT-OUT, 8 Maze Green Road, Bishop's Stortford, Herts CM23 2PJ.

PLAYMATES ENDS

It seems that fanzines are finding it pretty difficult at the moment, with Playmates being the latest to go down. I actually flicked through it for a quick glance and thought it was pretty humorous. However, that's life as old Esther would say!

MINI-SURVEY RESULTS

We've had lots of comments and requests from the mini-survey. They are:

We want a covertape...
We are, in principal, against the idea, but obviously we'll be giving it more thought if that's what you want.

More Letters...
Two pages is a lot, unless you want us to drop something else.

No more console coverage...
We can reveal that this month is the last one to feature consoles - no more, honest.

More on consoles...
Sorry, you've had all that you'll be getting.

Listings and 10-liners...
10-liners...whazzat? As of issue 5 (when the Basic tutorials finish), would-be programmers will be flooded with program listings. Short, long, BASIC, Hex, and assembler...it's all gonna be there...so should you.

More Pokes and Tips...
You got it, as from next month a regular extra large pokes section. It'll be bigger than your average tips section.

More complex programming and hardware projects reviews...
We got us a teccy editor and as from next issue, he'll be disembowelling CPC's and reporting on what's happenin' in the CPC scene.

Top Ten of different types of games...
Crap idea when you've got the Top 50 games listed.

Larger PD section...
You've been listening to our telephone conversations. As of next month the PD section will be at least 2 pages and one extra line - at least!

Better Screenshots and longer reviews...
Sorry about the crap screens - they were really good before the magazine was printed...erm...sorry! As for longer reviews, they will return as soon as we get some space about here.

Attack! set out more clearly like AA...
Oh, what a boring idea. You'd then have two CPC magazines that looked the same.

Why wasn't Tasword included in the WP comparison?..
'Cos it's not got a professional look-in and better PD word processors are available.

More serious stuff...
More serious stuff is what you shall have. Watch this space.

Readers programs...
Get sending!

No future issues of CPC Attack!
BOG OFF!!!

JUNE COMPETITION WINNERS

We had loads of entries to the compo. In fact, so many that all the guys in the internal mail department were off sick! Too much work for them I suppose. Anyway, any day now a Securicor van will be driving down Dean Park Avenue and stopping outside number 100. Yes; Alan Kennedy from Edinburgh that's you! The prize, as promised, is an Epson LQ-570 24-pin printer. Good Luck with it.

For 10 lucky runners up, a copy of Lemmings. These are:
Timothy Campbell, Newtownards; Mrs J.Linwood, Southampton; Steven Cloud, Narberth; JV Garbutt, Birkenhead; H Witer, Brighton; Gary Nicholas, Basildon; Louise Marsden, Blackburn; Jamie Gunn, Arbroath; Ross Potter, Haslemere; Andrew Downes, West Bromwich.

There are also five winners who will each receive 10 games from the Top 50 as of issue 1. These are: Jo Baker, Southampton; Kevin Crooks, Glasgow; Sarah Brown, Newcastle; Justin Gray, Chatham; and Bill Thurrock, Wandsworth.



LOST IN SPACE!

CJ the Elephant is getting about as popular, in the Codie camp, as Dizzy and Seymour. It's not surprising then, that he's been given a third mission. Well, not really been given it, he's lost in space along with many other elephants. CJ takes it upon himself to rescue the other elephants and return safely to Earth. The silly elephants have used escape-pods to abandon their crash-bound shuttle and have been dispersed onto different planets. The platform action features the multi-directional scrolling seen in the previous CJ romps.

LETTERS

Welcome to the letters pages. It's all here...all the gossip...all the views...all the comments...it's the biz

Gotta letter? Then get it in:

LETTERS,
CPC ATTACK!,
HHL Publishing,
Greater London House,
Hampstead Road,
LONDON NW1 7QQ

or fax:
071-387 9518

Yo!

I just bought CPC Attack! and I think it's superb! It should attract lots of readers, but not if you include Console Crazy - the only thing I found crap in it was Console Crazy - I mean what are you trying on man, this is a flippin' Amstrad magazine, not a flaming console update. Even though many think they are popular, they're not, so don't put garbage like that in an Amstrad magazine. It's called CPC Attack! and that should mean everything to do with Amstrads and not flippin' consoles. You wasted 9 pages on it so far, good grief stuff that!

On the charts pages you listed Wrestlemania 2. Is there such a game? I don't know - is it a misprint or is the game available?

I want a copy of the magazine that was shown on the very last and final ACU, where can I get it?

Kenneth MacLeod, Stornaway

Consoles are happening. I agree with most of what you've got to say, but hey, we're 8 pages bigger than Amstrad Action so putting about 4 pages of console stuff in isn't going to hurt -is it? Most computer owners are interested in playing games and as very few new games are coming out for the CPC, many CPC owners will want to buy another machine for playing games on - using the CPC for word processing and programming etc. It would be stupid to buy an Amiga, Spectrum, C64, or even IBM - a console is the best choice for most people. All we're doing is giving, to those interested, an understanding of what is happening on the games front. Okay, so only half of the readers want it and the other half dead opposed - what do we do? I think that if we don't report on what is happening then lots of readers will buy the wrong machine - and regret it. As for you, you won't lose a thing `cos the console section replaces pages which were allocated to the game reviews section - games, as you know, aren't as happening as they used to be in them old days.

Wrestlemania 2 will probably come out on console, but not CPC. Yep, it was a misprint. As for the issue that was shown in ACU, it was never produced - it was a dummy cover, made up of pictures and coverlines taken from previous ACUs to show the difference. In actual fact, the logo design has been changed since then. So don't worry, Issue 1 of Attack! was the very first issue and there are no secret, or limited editions kicking around.

Boom!

I visited the MIDI show in London and was amazed to find no reference to Amstrad compatible music software. Other machines may be dominant in that application, but I am sure that there is some latent Amstrad demand. Does anyone share my interest in music software for the CPC6128 and can offer help with the following?

I have a copy of The Music System, originally distributed by Firebird. Does anyone know where I can obtain a copy of the later development, The Advanced Music System,which had a MIDI module?

I have just bought the MIDItrack Performer and MIDItrack Music Editor, marketed by Electromusic Research, and have connected them up to a Yamaha PSR300 keyboard. I am slowly mastering the set-up and would appreciate contact from any experienced users.

Please print my address.

S.C.Rowden, 16 Howard Gardens, Guildford, Surrey GU1 2NX

NEWSAGENT ORDER FORM

Dear Newsagent,
I'm that Jones boy down the road. Keep me a copy of CPC ATTACK! every month, and don't let anyone else say otherwise!

Name...
Address.....................................
....
....
....
Postcode...................................

• Newsagent: You can get CPC ATTACK! from your local wholesaler.

Oi you!

After reading issue 1, I sent for the Utilities 3 disc that was reviewed. I received a reply saying that Penguin Software had closed down at the end of March. Where can I get a copy? Also, please don't put competitions and survey forms on the back of editorial pages. I want to keep my copy as perfect as when I bought it.

Most of the magazine was great, but the PM&T pages aren't big enough. The Q&A section is great, both BASIC tutorials are good and the letters pages can be amusing at times. The top 50 games section was good, as was the...

Anon (not really we lost the name!)

Sorry about the Penguin Software muck up, but I am told that most of the Utilities discs are universally available from any reputable PD supplier - see the Public Sector pages. We'll try not to put cut-out coupons on the back of editorial - they can be photocopied, put on a postcard etc. - but only if it is not done to gain multiple entries!

Wow!

I'd like to say congratulations on the new arrival of CPC Attack! which I adore. However, I'm very concerned about the CPC's progress - I'm writing on behalf of all the GX4000 and 464+ owners.

I recently upgraded from a 464 to a 464 PLUS, which I am quite proud of, but I was a little disappointed when I heard news that the GX4000 flopped and the CPC+ sold poorly.

Why have all the Amstrad cartridges being cleared off the shelves? Why are Nintendo and Sega on top? Is the CPC finally out of the games industry despite the fact it's potentially every bit as good as 8-bit Nintendo and Sega offerings? Take Pang and Robocop 2, for example, they are every bit as good as their Amiga counterparts. Even some cassette games such as UN Squadron, Mercs, Rodland, Final Fight and Baby Jo, which I own, are as good on the CPC as they are on the Amiga.

But I have problems getting cartridges for my machine - I've even searched in the Virgin Megastore.

Lastly, will the long-awaited ROBOCOP 3 be available on the Amstrad Cartridge?

Mohammed Jeetooa, London

Yikes! To answer your last question first, no, Robocop 3 won't make an appearance on Amstrad carts - but it will be on disc later this year. The softcos stopped making Cart games months ago. The Addams Family, reviewed in this issue, seemed certain to be the last mainstream full-price release on the Amstrad, but all the top softcos have stated that they will be releasing big licenced games on the CPC.

Unfortunately, the GX4000 is as much use as a wet towel! Sega and Nintendo are ahead in the console stakes because of the huge amounts of money spent in marketing the machines. However, although CPC games are good, the machine's technology is over 10 years old - it can't live forever, but it's got a good year or two left.

✻ READER REVIEW ✻

Answering the question: Is Brunword better than Protext? The answer is an unequivocal YES.

It's cheaper; thirty quid buys a word processor, spelling checker and a card index with search and sort, mail-merge and label printing, whereas Protext costs around forty quid and only performs the first two features.

Brunword is faster; the dictionary being all held in memory, the spelling checker whistles through the text at a few seconds a page, whereas Protext's need for frequent disc access makes it much slower.

It's easier to use:

- no matter what changes you make, the text is always word-wrapped correctly, while Protext requires constant re-formatting.
- there is no need for printer drivers, since everything of consequence, printer menu, screen margins, tabs, and control codes is saved with the file.

It has numerous features Protext hasn't:

- you can incorporate a 9-character initialisation sequence in the printer menu, which like everything else is saved with the file.
- the disc is catalogued automatically with every Load or Save.
- page-breaks are displayed on-screen.
- a chaining facility enables you to handle files of unlimited length.
- the 11 non-alphanumeric keys, such as the "wiggly graphics" and the 10 numerals preceded by CTRL can each be redefined so as to send to the printer any 10-character sequence you wish and to display any symbol of your choice.

Protext has an edge over Brunword with its control codes; you can program more keys and hold more characters in them. Otherwise, Brunword strikes me as fairly superior in every important respect.

Mike Catton, Gosport

✻ If any reader wants to review a piece of software/game then they can write here to get published. ✻

Get Off!

I am writing in to defend CP/M and the Public Domain libraries after reading the replies to two letters published in issue 1.

Firstly, it is implied that Paul Firman is doing wrong by distributing the excellent PD word processor, VDE, in its modified form. VDE is meant to be altered - it comes with its own installation program, specifically for the purpose of running on a wide range of computers. Full marks to Paul for offering this excellent program to the public for no charge, along with the (also PD) spelling checker, both of which I already have, but from a different PD library.

Secondly, although I agree that the utilities side of the disc supplied with the 6128 Plus is a bit specialised and out of date (it is mainly used for writing CP/M assembly language programs) that does not mean that the System side of the disc is likewise out of date.

There are thousands of programs in the Public Domain which will enable anyone, for a small copy charge, to harness the full power of CP/M. CP/M is a text only system, so you won't find arcade games, but you will find excellent word processors, databases, file handling utilities, communications and yes, even a few games of the more intelligent variety.

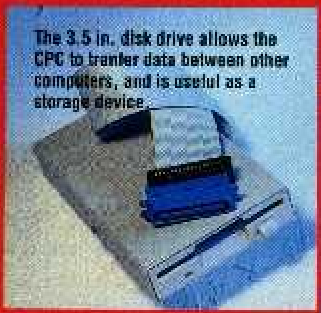
So I would urge anyone, who has consigned their CP/M disc to the back of the drawer, to send a few discs off to some of the many flourishing PD libraries, and perhaps they can discover what they have been missing. And the best thing about it is that it's virtually free!

Andy Gibbons, Peterborough

Well said, and top marks for being a very sensible fellow indeed. Paul Firman wasn't shown the boot, but we thought that it would be wise for a quick rain-check to ensure that modifying that particular product was legal. So, it appears that it is. Fine.

STORAGE

Computers are absolutely marvellous at organising information, be it a list of names & addresses, or a company's financial transactions. The benefits only really become apparent when dealing with large amounts of data, but this raises a question - where to store it all? Several possible solutions follow.



The 3.5 in. disk drive allows the CPC to tranfer data between other computers, and is useful as a storage device.

External Disk Drive

3": Amstrad DDI-1, £150: Amstrad FD-1, £100
3.5": SD Microsystems, Siren, Microstyle, £80
5.25": KDS, £100

If you're frustrated with how long your tape based software is taking to load, or are fed up with continually fast-forwarding & rewinding, desperately trying to locate an elusive program, then a disk drive should be your number one priority. Disk drives are much, much faster and allow you to access any of your programs almost instantly.

Several sizes of disks are currently in use within the computer industry, most of which are now available to the humble Amstrad owner.

3" disks are expensive, bulky, low-capacity, and hard to obtain so why bother to use them? Well, firstly, they are THE standard for Amstrad disk software. Secondly, you haven't got any choice. This will be obvious to 664 and 6128 owners, but what's to stop an owner of a 464 opting for something different? The answer lies in a special chip containing AMSDOS (AMStrad Disk Operating System) necessary for the operation of any disk drive. Unfortunately, the only way to obtain this is to buy an Amstrad DDI-1 3" drive (664 & 6128 machines already have it built-in). Extra 3" units may be added by purchasing the cheaper FD-1.

Amstrad's strategy of opting for proprietary designs, rather than following the usual conventions, is perhaps best illustrated by their decision to use 3" disk drives. In 1984 they were the only manufacturer using them and, eight years later, the situation remains the same. It's because of this that the cost of both drive and disk remains high. If you already own a 3" unit and are looking to buy a second drive then your choice is greatly increased.

The two alternatives you're most likely to consider are 3.5" and 5.25" types - both extremely popular in the PC world. The 3.5" format is also used by Apple Macintoshes, Commodore Amigas, and Atari STs. Unlike their 3" cousins, 3.5" disks are cheap (typically 40-50 pence), widely available, do not need turning over, and can store a massive 720-800K of data. Add to this the low price of the actual drives and you're onto a real winner.

Disk drive mechanisms are highly standardised so, when shopping around,





One of the best expansions is the 3in. disc drive unit for the 464

Labelling an Amstrad home computer as a 'games machine' is like saying a Ferrari will get you from A to B - it may well be true but it's something of an understatement. There are a whole myriad of clever gadgets & gizmos that not only expand

concentrate more on the software that each supplier bundles with their offering. The most important point is how accessible the extra space is, after all, AMSDOS only ever expects to see a maximum of 178K free space. Most companies will supply a small software 'patch' that allows the computer to read/write up to 800K per disk, but check to ensure compatibility with your favourite applications. The second feature to watch out for is the ability to read and write to disks formatted on other types of computer. For example, if you use IBM PCs at work then it could be useful to exchange word processor files with your Amstrad at home.



Hard Disk

HD20, Dobbertin - £400 approx.

This has to be the ultimate add-on for any CPC - imagine having 20 Megabytes (20480K) of storage capacity instantly available at your fingertips! Unlike their floppy cousins, hard disks are permanently fixed inside cases and are not designed to be removed. Because of this, the actual disk is able to spin much faster and much more accurately, enabling enormous amounts of data to be accessed far quicker than from a normal floppy disk. PC users couldn't survive without them; hard disks really do revolutionise the way you use a computer.

The HD20, originating in Germany, arrived on the scene just over a year ago, sporting what has to be the largest case of any Amstrad peripheral. A smaller interface is also included, containing the XD-DOS rom which replaces AMSDOS. As is common with hard disks, the HD20 is split up into four smaller 'logical' drives, D, E, F & G, each capable of storing 5 Megabytes. This may seem strange but in actual fact it makes organising your files a great deal simpler. Once CP/M has been altered, it has no trouble utilising the extra space and can even be booted from the hard disk. If the A:> prompt isn't your scene then XD-DOS provides a great deal of functionality from within BASIC, expanding on the standard AMSDOS commands. As with many cutting-edge CPC add-ons, certain applications may not recognise the new technology so be sure to check compatibility before buying.


20 Megs of [illegible] can be had with this [illegible]

RAM Expansion

DK'Tronics 64K, Datel, £49.99

DK'Tronics 256K, Datel, £99.99

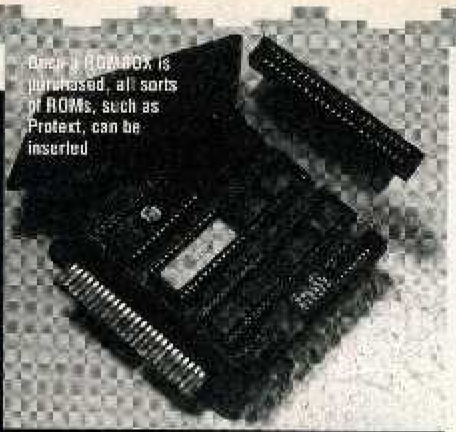
There are two things that every computer user is always after - more speed, and more memory. The easiest one to improve is the memory capacity, so, if 64K is cramping your computing style, a RAM expansion could



the hardware potential of the machine, but also the mind of its user. The following pages constitute a definitive guide to the pieces of kit available, what they do, and what benefits you can expect from their use

be the answer. 464 owners will benefit the most, as an extra 64K will enable them to use software designed exclusively for the 6128, e.g. Advanced Art Studio, Stop Press, CP/M+, Magnetic Scrolls adventures. Your own home-brewed programs can also take advantage by utilising the 14 extra BASIC commands provided. These support features such as storing multiple screens (whole or just selected areas), bank switching, and the direct peeking/poking of values.

Both DK'Tronics' products offer a similar degree of functionality; the silicon disk is accessed through AMSDOS as if it were a standard drive. For owners of 6128s or RAM expansions, the software solution is probably the more cost-effective. Although both units function correctly with CP/M 2.2 be warned that neither is happy with CP/M+.


Once a ROMBOX is purchased, all sorts of ROMs, such as Protext, can be inserted

Silicon Disk

64K (software), DK'Tronics, Datel, £29.95
256K (hardware), DK'Tronics, Datel, £89.95

Silicon disks treat an area of memory (RAM) as if it were a floppy disk. This may seem rather illogical, after all, the reason computers use magnetic media is to store large amounts of programs/data in a cheap, permanent and portable form. Silicon is none of these things but, despite its high cost, volatility and low capacity, it does have one major advantage - speed. The reasoning behind silicon disks is that having initially copied the contents of a slow floppy disk to fast memory, subsequent access will be an order of magnitude faster (typically 100ns as opposed to 100ms, thus 1000 times faster). Once no longer needed, the information can be copied back onto floppy disk for permanent storage. The disadvantages of this are the tying up of valuable RAM, and possible loss (due to a power failure) of any changes made before saving to a floppy.

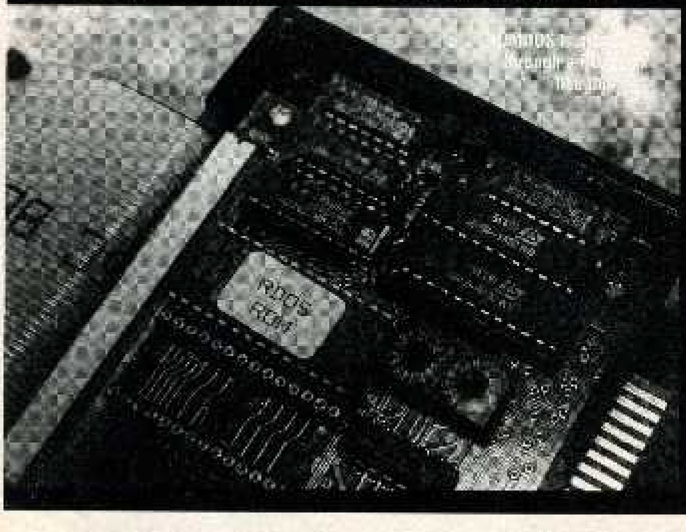
ROM Board

Rombo, Rombo Productions, £30
Brunword ROM Module, Brunning Software, £125

Sometimes even disks can seem too slow, especially if it's a piece of software that you frequently load, a word processor for example. ROMs (Read Only Memory) are memory chips that retain their information when power is removed, and therefore make an excellent storage medium for finished programs. Their main disadvantage is that once programmed their contents cannot easily be altered. Generally this is not a problem and, indeed, is often an advantage for system software such as our very own Locomotive BASIC, which is stored on a ROM inside the computer.

Adding extra ROMs is greatly simplified by plugging a ROM board into the expansion port. This type of board will generally have eight empty sockets, just waiting to be filled with ROM software. The type of software available varies greatly, from word processors (Protext, Brunword) and communication packages (Honeysoft, Cage), to programming toolkits and machine code assemblers (Maxam). ROMs are a little bit more expensive than disks but in addition to being instantly available, they do not need precious RAM to store the program code.

If you have a specific ROM application in mind then a cheaper alternative is the cartridge. This is essentially a ROM board with just one socket devoted to your chosen piece of software. A good example is the excellent Brunword ROM module that utilises a quite massive 256K ROM to store a word processor (plus extra fonts), spelling checker, and database!



Eprom Programming

Siren Software, £40
John Morrison, £50

Any ROM board owner who is less than overwhelmed at the range of ROM software available may like to consider an EPROM (Erasable Programmable ROM) programmer. EPROMs have the advantage that their contents can be programmed electronically and, should any subsequent alterations be required, wiped by prolonged exposure to intense ultra-violet light. The upshot of all this is that a reasonably determined user can put their own programs onto a chip for future, instant recall via a ROM board. Blank 16K EPROMs cost in the region of £5. EPROM programmers and their software aren't renowned for their user friendliness so be prepared to get your hands dirty. A working knowledge of Z80 assembler and the CPC's firmware will certainly come in useful.

Light Pen

Light Pen, DK'Tronics, Datel, £15
Dart, Dart Electronics, Datel, £30
Electric Studio, £20-30
LP-1, Amstrad, £20

Light pens have long been a favourite add-on for home computer enthusiasts. They're not the easiest things to use but nothing else actually lets you 'draw on the screen', literally. The idea is that when the pen is held against the screen, a light sensor in its tip senses the scanning 'raster' of the monitor and signals the computer. The time at which this signal occurs is used to calculate the screen co-ordinates corresponding to the pen's position. Used in conjunction with drawing software a light pen may be used to produce images on the screen, or select an item from a menu of options.

All the light pens mentioned above come equipped with art/drawing packages varying in sophistication. Electric Studio's is probably the best. Amstrad's the worst (NB. The LP-1 will only work with colour monitors). Incorporating support for a light pen into your own programs is also possible.

Mouse

AMX Mouse, AMS, £60
Genius Mouse (includes Adv Art Studio), Datel, £49.99
Master Mouse, Siren Software, £49.99

Mice, once an obscure input device, have now become "de rigueur" for virtually all personal computers. For those not familiar with them, computer mice are small plastic boxes with a ball on their underside, which the user slides around his/her desk. The mouse's movement is mimicked on the screen by a tiny pointer which can be used to perform various actions. The speed at which these electronic rodents have taken over the computer world is quite phenomenal. Their meteoric rise in popularity is largely due to the increasing use of graphical user interfaces (GUIs) - environments that employ windows, icons, pull-down menus, etc. to make computers easier & friendlier to use - first commercialised by Apple, and now adopted by Atari, Commodore and Microsoft. The latter company's Windows software is causing a revolution in the computer industry with 10 million copies sold in just two years.

INPUT DEVICES

Most computer users have, at some stage or other, tried their hand at drawing. After the initial novelty of painting your name on the screen, disappointment usually sets in as future efforts bear little resemblance to your envisaged masterpiece. The main reason is the lack of intuitive control; we learn to use pens, crayons etc. from an early age so, unless you're an 'etch-a-sketch' fanatic, trying to draw pictures with the cursor keys or a joystick can be rather alien. Several more convenient alternatives exist.



Predictably the CPCs haven't escaped, several mice have been released over the years. The first and best known is AMS's which can also be used with their Stop Press, Max and 3D Zicon software. All the mice come equipped with art programs, though Datel's inclusion of the much-praised Advanced Art Studio (requiring 128k of RAM) does eclipse the other two somewhat.

There is little to choose between the actual performance of the three as all rely on similar mechanical design. In conclusion a mouse is a great device to own, providing a surprisingly comfortable interface to a large variety of software, as well as being downright fun. Any of the listed offerings make worthy add-ons but budding artists should find Datel's bundle particularly attractive.

Digitizers

Vidi, Rombo, £60 approx.
Dart Scanner, Dart Electronics, Datel, £60 approx.

Always a great crowd-puller at exhibitions, digitizers excel at converting live images/photographs into a form that can be manipulated by computers. Rombo's Vidi unit performs this operation on video signals while the Dart Scanner digitizes printed images.

The Vidi video digitizer takes a composite video signal (or RGB with suitable cable) and turns it into a conventional picture on your computer screen at the rate of three a second. The images can then be saved to tape/disk, loaded into most art packages and altered etc. Vidi really comes into its own when connected to a video camera as you yourself can then choose images to 'grab', a particularly addictive pastime. Although the end results are a tad grainy they are still instantly recognisable.

If you're only interested in digitizing printed images then a cheaper solution to a Vidi unit & camera is the Dart scanner. The process is rather like printing in reverse, a small light sensor is clipped onto the print head of a dot matrix printer that scans back and forth over any paper that is inserted. Normal printing is not affected but the device will only fit onto Amstrad DMP2000/2160/3000 or 3160 printers.

The saved images from both devices can be imported into the Stop Press desktop publishing software, making for some impressive-looking documents.

Modulator

MP-1/MP-2, Amstrad, £29.99
MP-3, Amstrad, £34.99

One thing that sets CPCs apart from other computers of their generation is their integral monitor. While this set-up works extremely well for most people, many would like to be able to connect their machines to a domestic TV. Not surprisingly, Amstrad soon launched a series of peripherals designed to do just this - the MP series of modulators. The screen display is not as crisp as that from a monitor but is generally acceptable, especially if only required for playing the odd game in colour. If your TV is equipped with a SCART socket you might like to consider a CPC-SCART cable as a cheap alternative. The MP-3 does the reverse, allowing TV pictures to be viewed on any Amstrad monitor.

AUDIO

You only have to watch 'Top of the Pops' to see the significant role computers play in the modern music industry. Artists such as Jean-Michel Jarre, Erasure, Richard Vangelis & Kraftwerk rely heavily on them to create their own unique sounds. As well as the microprocessors found in virtually every modern synthesiser, computers are used for sequencing and sampling sounds, making them a standard piece of equipment for a recording studio.

Your humble CPC is capable of a lot more than the pathetic beeps and whistles that most programs produce, if only given the necessary hardware.

Amplifier

Sound Blaster, Siren Software, £29.99
Maestro, Vanguard Leisure, £34.99

You'd be forgiven for thinking that amplifying your existing sounds would not yield much of an improvement, after all, the actual sounds themselves remain unchanged. The reality is that their quality is greatly enhanced, particularly bass frequencies. The end result, although still very 'computerish' and artificial, is much more acceptable and might even be construed as 'pleasant'. The effect can be cheaply obtained by connecting the computer's stereo socket to a normal hi-fi system; ask your local electronics/Tandy shop for a suitable cable.

If you want the benefits of fuller stereo sounds without tying up your music system, a dedicated amplifier might well be the answer. Although virtually any amp will suffice, the two listed above are marketed specifically for this purpose. They feature volume/tone controls, integral power supplies and a set of headphones. The speakers themselves are similar to those used with car stereos.

Speech Synthesiser

SSA-1, Amstrad, £29.99

DK'Tronics, Datel, £29.99

There is something quite unnerving about hearing a machine talk to you. Simply because it utters human phrases, we automatically credit it with the intelligence and sophistication of a real person. Perhaps it is the creation of this apparently 'intelligent' facade which attracts users into equipping their silicon beasts with speech synthesisers.

Both the units listed are based around the same chip (Texas Instrument's SPO256), and offer the additional feature of being a stereo amplifier with small speakers provided. Words are constructed out of a set of around sixty phonemes (including all the necessary vowel sounds, fricatives, sibilance, etc.), played in sequence. This process is made a good deal easier by the bundled software that allows standard English sentences (including numbers) to be entered - the subsequent conversion into phonemes is then handled automatically. Little commercial software takes advantage of speech synthesisers so the onus is really on you to write your own programs. The included RSXs are a doddle to use and require only a small amount of BASIC programming knowledge.

MIDI Interface

Miditrack Performer, EMR, £99

Music Machine, Datel, £49.99

Over the last 10 years MIDI (Musical Instrument Digital Interface) has become standard on virtually all new synthesisers/keyboards. MIDI is a simple communications standard that allows suitably equipped instruments to exchange information concerning the pitch, duration and strength of musical notes, plus much more specific data. The result of all this is that many instruments can be controlled by just one keyboard/sequencer, musical compositions may be stored/manipulated/replayed, drum machines synchronised etc. Despite their increasing sophistication, a synthesiser's strength remains its sound generation capability rather than that of data storage. Professional musicians have therefore turned to computers in order to manipulate instruments and store compositions easily.

Equipping your computer with a MIDI interface, thus allowing it to tap into all this information, opens up a whole new world of musical possibilities. Notes quickly played on a keyboard can be displayed on the computer screen, subsequently edited, stored on disk, extra tracks added, and then the finished composition played at the touch of a button. If your fingers aren't nimble enough to cope with your favourite piece of classical music, simply enter the notes individually into the computer and let it play the keyboard for you. Owners of more expensive synthesisers can reap extra benefits by designing new sounds (or altering existing ones) on their computer screen, before downloading them back to the synthesiser via MIDI to be played. Basically you're combining the professional sounds of a synth with all the functionality of a modern computer.

Hardware-wise there isn't really much to choose between different MIDI interfaces, they either work or they don't. Far more important is the software that's used with the interface, as this determines what you will be able to do. Neither interface's software is particularly sophisticated, especially when compared to that available for other machines such as the Atari ST, but EMR's is far superior to Datel's. This is understandable, not just because of the price difference, but because the Music Machine offers many features besides MIDI (see below). Miditrack Performer allows a composition to be comprised of eight tracks, each corresponding to a single MIDI channel, and carries out its recording in real-time. Key velocity, pressure & after touch may be stored, with bad notes being easily corrected once stored in the computer's memory. Look out for third party MIDI software including a step-time sequencer, and DX7/ESQ1 patch editors.

Sampling /Playback

Music Machine, Datel, £49.99

Amdrum, Datel, £14.99

Synthesising sounds has its limitations, the end results invariably have an electronic feel, and imitating the intricate complexities of existing instruments is virtually impossible. Sound sampling enables computers to digitally 'record' real-life noises, and then reproduce them with near-perfect accuracy. A sort of electronic mina bird. The art of sound sampling has become far more accessible in recent years, thanks to the relentless progress of technology. Originally popularised during the 1980s, straight sound sampling effects are now rather 'stale' thanks to their (ab)use by musical plagiarists. Nevertheless, there are still plenty of creative uses for this exciting technology.

Sampling sounds means digitizing them; converting the fluctuating analogue voltage from a microphone into a string of numbers which can be subsequently stored, manipulated, and replayed by a computer. The biggest disadvantage of processing sounds digitally is the



CONNECTIONS

Each computer seems to exist in a world of its own, an abstract world inhabited by bits, bytes, RAM, ROMs and other strange entities. Getting a computer to share information with other machines or read data from a source outside of its domain can be a tricky business. Computers communicate in a precise and unforgiving way, employing hundreds of subtly different data formats. One wrong bit or corrupted byte can mean disaster. It's therefore not suprising that many users avoid this mysterious side of computing, preferring to stay within the safe, cosy confines of their home machine. The products in this next section attempt to bring back that spirit of hi-tech adventure to all you budding armchair explorers.

large amount of storage they require - a CD has a storage capacity of over 500MB (megabytes). One second of sound roughly equates to a minimum of 16000 numbers! Sixty-four kilobytes (64k) of RAM can store around four seconds. This may not appear very much but when you consider that most musical sounds last only a fraction of a second, it's actually quite usable.

Amdrum's electronics are dedicated to replaying short snatches of sampled sound, particularly those of drums - the device's intended used. The unit plugs into the expansion port and requires an external amplifier or headphones in order to hear its output. Eight sounds are included: bass drum, snare, mid & low tom-toms, cowbell, open & closed hihats, and claps. Each drum sound is astonishingly close to its acoustic original, clearly illustrating the advantage of using samples. The package includes software allowing rhythms to be designed on the computer screen, either by entering numbers onto a chart or by tapping out a beat in real-time. Once stored, rhythm elements may be linked together, repeated or looped, and the final sequence saved to tape/disk.

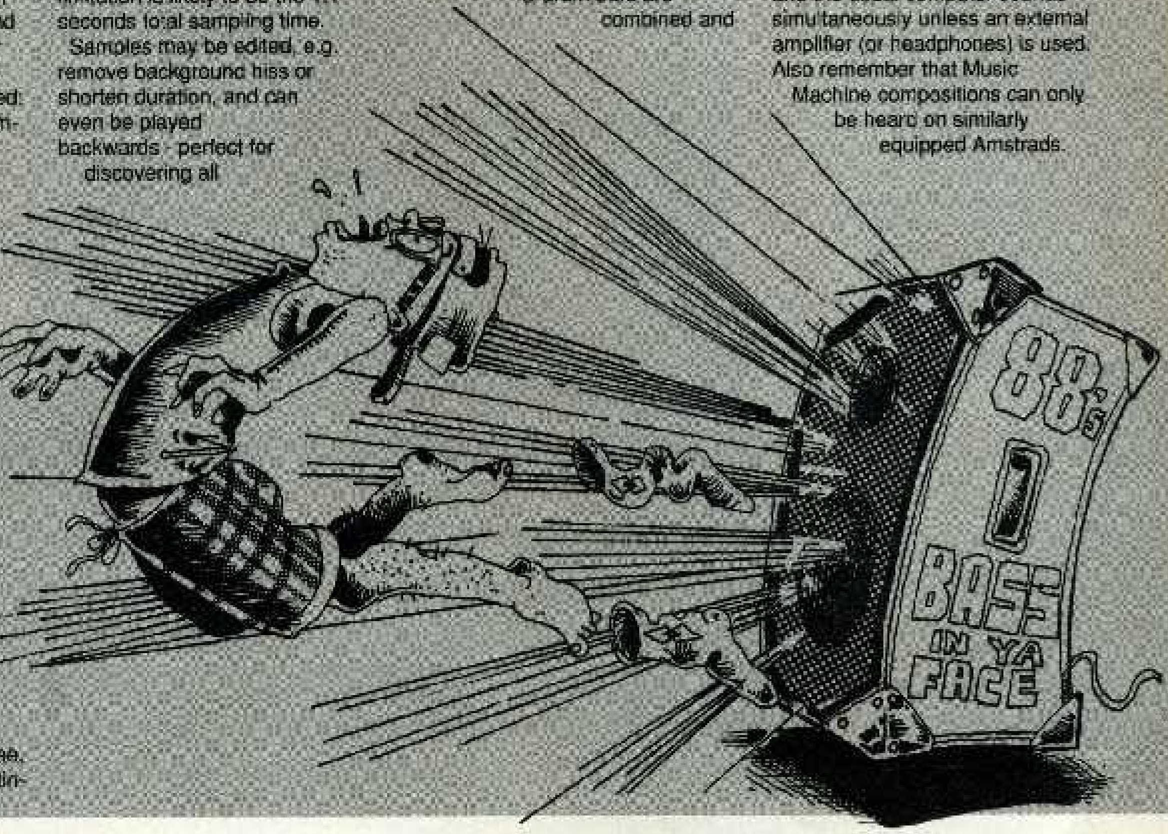
The demonstration rhythms are extremely impressive and professional-sounding, covering numerous styles such as rock, Latin, reggae, rap and march. Extra tapes (Latin-American & electro-pop) allow additional drum sounds to be loaded should you tire of the original eight.

The Music Machine is probably the most comprehensive music add-on yet to appear for the CPC. Its versatility stems from its ability to sample/store new sounds using the included microphone. Although the demonstration sound samples are of drums, and quite breathtaking they are too, you can sample absolutely anything you like. A maximum of eight sounds may be held in memory simultaneously but the biggest limitation is likely to be the 1.1 seconds total sampling time.

Samples may be edited, e.g. remove background hiss or shorten duration, and can even be played backwards - perfect for discovering all those satanic lyrics. A simple 'piano' option allows sounds to played over a range of one octave, thus a single sample of an instrument, e.g. a flute can be used to play a simple melody.

Once you've assembled a reasonable collection of quality samples on disk, the Music Machine's software allows you to arrange them into a song using its bar editor and drum editor. The latter is designed for rhythms while the tune editor's role is to arrange melodies. Both enable a time signature and tempo to be specified. The finished music & drum bars are combined and arranged into the correct order using the tune editor. Complete tunes can be saved/loaded to disk/tape and played back automatically at the press of a button.

As with the Amdrum, problems occur when listening to the Music Machine's audio output. It is not possible to hear sampled sounds and the usual computer sounds simultaneously unless an external amplifier (or headphones) is used. Also remember that Music Machine compositions can only be heard on similarly equipped Amstrads.



RS232 Interface

Amstrad/Pace, £50 approx.

In an industry filled with a plethora of differing standards, RS232 stands out due to its wide-acceptance and longevity. RS232 data is transmitted in serial form (each bit is sent in sequence along a single wire) as opposed to parallel (eight bits are sent simultaneously along separate wires) and includes a multitude of 'hand-shaking' lines to control the flow of information. One of the big advantages of RS232 is its machine-independence - exactly the same standard is implemented on Atari Sts, Amigas, PCs, Macs, etc. Thus if you were to purchase a peripheral such as a modem, plotter, printer, Eprom programmer, bar-code reader or data logger that incorporated an RS232 interface, any number of different incompatible computers could communicate with it. RS232 interfaces are also becoming increasingly common on scientific instrumentation. Kitting your CPC with such an interface allows you to tap into this vast range of third-party products.

As well as enabling computers to 'talk' to external electronic gizmos, an RS232 link allows the transfer of files/information between different computers. No messing around with strange disk sizes or formats. Simply string a cable between the two and sit back and watch your data whiz across from one to the other. This method of transfer is extremely common with portable laptop computers which are not generally used as 'base' machines and often lack a floppy drive. Exactly the same method can be used with the new breed of electronic personal organisers e.g. Psion Organiser.

Some of the most best-known RS232 peripherals are modems. These wonderful boxes allow a computer to send and receive information over a normal telephone line. Glamorised by 'hackers' (with the help of the media), modems allow access to a wealth of on-line services including Prestel, Micronet, CIX, and Compuserve, plus literally thousands of bulletin-boards. These services offer diverse facilities but most include computer news/gossip, electronic mail, downloadable programs and conferences. The shear amount of knowledge and experience pooled together on these systems is mind-boggling. Having said this, there is a price to pay. In addition to the initial outlay for equipment, your telephone bill will certainly increase, commercial services charge a regular subscription rate, and extra on-line fees may also be levied - particularly for playing the many (and incredibly addictive!) multi-user games. Sensible usage (stick to off-peak times) and the utilisation of local-rate nodes can certainly help keep the cost down to a reasonable level.

The actual Amstrad/Pace RS232 package includes all the necessary hardware, software & firmware to get you started and will meet virtually all of your comms needs. A terminal emulator is included and features specific support for Prestel. RSXs allow files, strings or individual characters to be transmitted or received, and viewdata format screens to be manipulated. The baud rate (default is 9600), stop/start bits, parity checking are all fully software controllable and

the usual XON, half/full duplex facilities are also catered for. The interface is fully compatible with CP/M so there is no shortage of commercial or public domain software to take advantage of it. If you become seriously interested in modem communications then an invaluable acquisition is the Cage Comms Rom software.

Teletext Decoder

Microtext, £75

There can't be many people who haven't experienced the British teletext services, Ceefax & Oracle. This add-on enables your humble CPC to receive, and more importantly decode, such information, providing access to the latest news, share prices, weather reports, etc. The system is totally isolated from your TV but is clearly targeted at those who do not possess a teletext-equipped set. There are obviously several advantages to using teletext with a computer, being able to store/edit pages on tape or disk for example. Unfortunately the opportunity to receive free 'tele-software', one of Microtext's original selling points, is no longer available.

I/O Expansion

Maplin, £30

In many cases the processing power of a computer is of little use unless it can respond to, and affect, events happening in the world around it. An input/output port allows just this. Plugging into the expansion port, an I/O card allows switches or other sensors to be read, and subsequently reacted to, and lights, LEDs, motors, buzzers, etc. to be controlled. Bear in mind that the pure logic outputs cannot drive anything requiring more than a few mA (this includes relays), so a certain amount of electronics (a transistor basically) is required to do anything useful. Once a relay is under computer control, mains appliances could also be switched on/off.

Maplin's offering provides 48 I/O lines that may be configured into various combinations of inputs and outputs. The card plugs into their 'Amstrad CPC 464, 664, 6128 Expansion System' that allows for several other exciting hardware developments.

Weather Satellite Decoder

Maplin, £140

If you've been searching for that elusive gadget to get one up on your neighbours then your quest could be over. Maplin's weather satellite receiver/decoder is certainly one of the most novel and technically advanced add-ons designed with the CPC in mind. It can receive signals from a number of different weather satellites and, once decoded by a special machine code program, a colour image displayed on the computer screen. Although the decoder can be interfaced to many types of computer, specific hardware and software details are given for both CPCs and BBC micros. The project is perhaps of limited long-term interest to the average computer user, but it might appeal to the serious amateur or school geography department.

8-Bit Printer Port

KDS, £19.95

Users of other computers may be a little surprised to see this product listed as an 'add-on'. Amstrad bucked the traditional eight-bit printer port design in favour of a cheaper seven-bit version (this was supposedly rectified in 'Plus' models). The number of 'bits' (binary digits) refers to the total number of values that the computer can send to the printer. Seven bits allows for the numbers 0-127 while eight bits gives 0-255. At first glance Amstrad's cost-cutting exercise may not appear too disastrous, after all, 128 numbers are more than enough to represent the printer's internal character set including control

MISCELLANEOUS

Some of the most interesting add-ons are often the most difficult to categorise. See what takes your fancy in this, the final, section.

Real-time Clock

DK'Tronics, Datel, £34.95

Keeping track of the time and date on a computer can be fiddly, as all trace of it is lost when the machine is switched off. Rather than re-enter it each time why not invest in a real-time clock. Plugging into the expansion port, this gadget ticks away keeping track of every second even while the computer is turned off. Once power is applied, the clock's battery is automatically recharged. The time and date may be used in your own BASIC/machine code programs, with leap years, weekdays, varying months all compensated for automatically. A nice feature is the alarm function that can be programmed to trigger at a certain time in the future.

For CP/M users a utility called CLOCK.COM is included to enable the date-stamping of files. This is particularly handy for deleting old unwanted work or for picking out the most recent of two files. As an added bonus, the real-time clock includes a simple 8-bit input/output port (see description in I/O expansion section). Don't expect too much help from the manual on using this as suitable applications are left to your own imagination. Overall, a handy gadget for people who like to be organised.

Multiface II +

Romantic Robot, £34.95 (also available for Pluses)

There can be few add-ons that offer something for both seasoned hackers and avid gamesters alike. The Multiface II is one such product. Its main selling point is its unbeatable tape to disk conversion features. The simple-looking black box fits snugly in the expansion port and offers a solitary red button on its case. Pressing this button freezes whatever program is currently running on your machine, and control is handed over to Multiface's software. From here several different options exist: return to your program, save the memory or screen contents to cassette or disk, edit memory, plus many others.

Should you choose to save the entire program to disk, Multiface will compress it to take up less room (this also speeds up reloading), and will ensure that all the program's attributes such as screen mode, colours, sound, etc. are preserved when you wish to load it up again. An added advantage of this process is that when loaded, Multifaced programs continue from where you pressed the red button - extremely handy for games that do not normally allow you to save your position. Due to the Multiface's clever way of bypassing anti-piracy checks, Romantic Robot ensured that transferred software will only run in the presence of exactly the same Multiface unit.

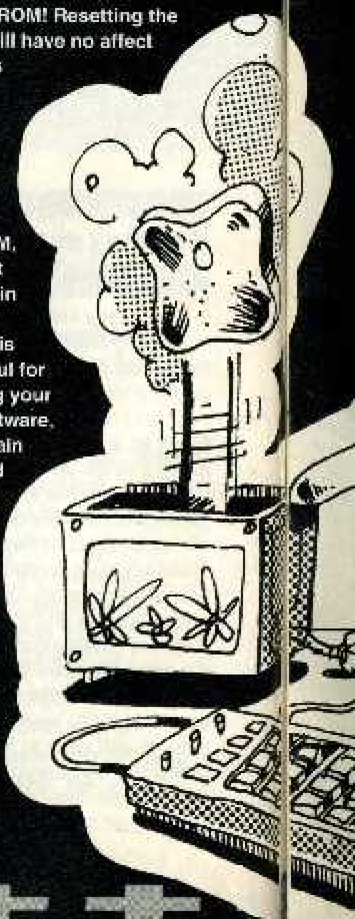
Apart from its stunning tape-disk transfer capabilities, the Multiface can allow hackers to view and alter the contents of the computer's memory. This is an ideal way of tracking down all those 'pokes' and can provide a valuable insight into the workings of a professionally coded program. Extra editing/disassembling facilities are provided by the optional 'Insider' software (£9.95).

AMRAM

Siren Software, £39.95

Amram should win the hearts of all you ROM addicts. It's basically two banks of 8k RAM that slots into rom socket five and can be accessed via the usual rom firmware routines. Once you've filled it up with code, flick the toggle switch and Amram becomes a ROM! Resetting the computer will have no affect on Amram's contents.

The bundled software can load data from another ROM, customise it and store it in Amram. Although this can be useful for customising your existing software, Amram's main role is to aid the



codes. However, many printers utilise numbers above 127 to provide special characters such as accented foreign vowels, graphics characters, line drawing shapes, mathematical symbols etc. Further problems occur when attempting to define your own characters as without the higher range of numbers, you may well find yourself limited to 'descenders' using only half of the printer's available pins. While these flaws may not worry the vast majority of users, for those who need to exploit their printer to the full, an eight-bit printer port is something of a necessity.

KDS's unit plugs snugly into the printer port and is fully compatible with BASIC, machine code, CPM 2.2 and CPM+ programs. To send 8-bit port data from BASIC, you must run a short 'patch' program which can easily be tagged to the loader of Tasword or Protext for example. One or two rogue applications have been known to bypass the new-improved port so you may wish to ensure compatibility before purchasing.

development of your own ROM-based applications. Rather than constantly blowing-erasing EPROMS, Amram offers a speedy 'clean' development cycle.


The WAVE widget allows the PLUS to access old-style expansion connectors

Plus-CPC Adaptor

WAVE, £10

It is unfortunate that there is a need for such a product. Amstrad seriously overestimated market support for its 'plus' range, companies have been unwilling to upgrade existing peripherals to accommodate the different connectors, let alone develop new products. Instead, Plus owners have come to rely on this simple 'widget' which allows standard CPC peripherals to mate with the Plus's expansion port. There's no complicated circuitry involved, just two different plugs soldered together. I'm afraid that if you're a 464+ or 6128+ owner with expansion in mind then sooner or later you'll need to invest in one of these adaptors.

Joystick Splitter

OJ Software, £8.95

There is nothing better than humiliating a close friend. Ramming his car off the road, shooting his plane out of the sky, lobbing a few grenades at him, or leaving him to fight the evil monster single-handed. Two-player games are undoubtedly tremendous fun but with only a single joystick port, one player is relegated to the keyboard, providing him or her with an excellent excuse to whinge when defeated! The solution is simple - use a joystick splitter cable to allow two joysticks to be used simultaneously. Several variants are available, all under £10.



Summary

So there we have it, just about every Amstrad peripheral that's ever been released. One or two may not have found their way onto the list but these are most likely rather obscure and probably didn't enjoy a widespread release.

By now you've probably worked out your Christmas list for the next ten years and are poised with credit card and piggy bank in hand. Unfortunately, availability is often a problem in the CPC world, especially now the commercial bandwagon has rolled on to pastures new (and with 16-bits). For companies still trading (see list below) there are obviously no problems. However, tracking down products no longer being actively marketed can be a major headache. Apart from constantly checking the thriving second-hand scene, a good place to search for bargain goodies is one of the 'All Formats' computer fairs which are held fairly often. When buying this way, try to ensure not only that the hardware itself works, but that it's accompanied by the necessary documentation/manuals and any software required for its operation. Small computer shops and mail order companies also tend to keep stocks of products for quite some time after their market-place demise. Basically the idea is to keep trying!

Contacts

Brunning Software, 138 The Street, Little Clacton, Essex CO16 9LS. 0255 862308

Dart, Unit B5, Oulton Works, School Road, Lowestoft, Suffolk NR33 9NA. 0502 513707

Datel Electronics, Govan Road, Fenton Industrial Estate, Stoke-on-Trent ST4 2RS. 0782 744324

Maplin Electronics, 0702 552911 (catalogue available from W.H.Smith)

Microstyle, 28 Belmont Avenue, Low Moor, Bradford, W.Yorks, BD12 0PA. 0274 602180

OJ Software, 273 Mossy Lea Road, Wrightington, Nr Wigan, Lancs WN6 9RN. 0257 421915

Romantic Robot, 54 Deanscroft Ave, London NW9 8EN. 081 200 8870

SD Microsystems, PO Box 24, Holbeach, Lincs. 0406 32252

Siren Software, Wilton House, Bury Rd, Radcliffe, Manchester M26 9UR. 061 724 7572

WAVE, 1 Buccleuch St, Barrow-in-Furness, Cumbria LA14 1SR. 0229 870000

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ATT 8

introducing the

SEGA MEGADRIVE

CONSOLE CRAZY

It's the most popular console on the streets. WHY?



The MegaDrive was the first 16-bit console on the market and, as such, it has leapt into an assailant lead in the console war. It is ahead of Nintendo's SNES (featured in issue 2) on weekly sales, but it is considered to be the less-impressive machine when it comes to colour hardware and video features. However, it's breaking all the grounds in the technological battle with CD-ROM planned for release later this year and games which are already pushing the hardware to its limits.







Sega scored heavily with their TV and cinema campaign, where the Sega games players were portrayed as being that little bit older and wiser than their Nintendo counterparts. This gave the oldies (16 and upwards) confidence to go out and buy the machines without being embarrassed. Nintendo scored an own goal as their corporate advertising portrays the market as being for 14 year-olds and under, thus eliminating the older generation. This view is mirrored in the games currently available for the machines. The Sega boasts games which attract the mature and seasoned player, while Nintendo has, up until now, only released arcade games and big film licence conversions.

In a way, the MegaDrive's position can be compared to that of the Atari ST in the early days of 16-bit computing - some seven years ago. Compared to the now successful Amiga, the ST was an inferior machine, but as it was the first machine available and boasted a more impressive software line-up, it sold in larger numbers.

While the Amiga was still experiencing teething problems, the ST had already been flooded with add-on devices and, as developers were getting to grips with it, much advanced software.

Similar comparisons can be made of the MegaDrive versus the SNES. While history reveals that the SNES will eventually be the more popular machine, the MegaDrive is leading the way in technological advancement and will do so for a year or two more. Who knows, it may just stay ahead of the SNES in the UK. One fact is clear - both machines are already successful worldwide and will be more so than either the Amiga or ST, but the console war is raging with a single goal - to decide which will be the more successful. →

JOYPAD versus JOYSTICK

"Is the joypad any good?" is one of the first questions asked when playing a console. Anyone who has played using a joypad would swear by it, while those that haven't can't imagine the extra control gained by one.

The Sega MegaDrive's joypad has three independent trigger buttons A, B and C. These are used to great effect during games and give the player choice of movement or weaponry without having to toggle a menu. The great scope of the joypads make keypresses, required on some computer games, redundant. It's far easier to play with a joypad than it is with a mouse/keyboard combination, or even a single-fire joystick. There is a joystick version of the pad available for players who want the stick, but it's not really necessary.

DEVELOPMENTS

US GOLD have the official worldwide exclusive rights to the game of the 1992 Barcelona Olympics.

The game can be played by up to four players and there are seven events in which to compete. The events: 100m sprint, Hammer, Archery, Pole Vault, 110m Hurdles, 3m Springboard Diving, 200m Freestyle Swimming require different skills, but it seems a pretty disappointing list. What happened to the javelin, weight-lifting, relays, distance running etc?

Olympic Gold is still an impressive launch, albeit without more events, but the ones that exist will serve to make it one of the best sports sims about.

SONIC THE H

This is the game that's sold more Segas than I don't know what! Sonic is a hero through and through, and has given console hardware major standing over computer hardware. Sonic wouldn't be possible on any other machine and that's why Sega are onto a winner.

Sonic is out to save his friends, who have been transformed into robotic creatures by the dastardly Dr.Robotnik. The bad Dr will be found at the end of the sixth zone. There are three stages in each zone, with restart positions - in case Sonic is killed. Along the way, Sonic has to transform the metal mutants back to cuddly animals, and collect

FIVE ALIVE

Electronic Arts are the biggest 3rd party console software supplier and they've only supported the Sega until now. E.A's games tend to be for the older, rather than the younger, player and they've always been quality releases which have sold by the bucketload. The EA games reviewed here would all win an excellent game award - in fact, most of them have, on one format or another. Anyone who is under the illusion that the console is an arcade machine only has to take a look at these popular strategy and sport simulation games to see that there's more to them than that.

DESERT STRIKE

ELECTRONIC ARTS ● £39.99

Return to the Gulf is the sub-title for this superb chopper attack action game, which was programmed in the midst of the IRAQ war. It obviously takes its gameplay from some of the operations that occurred out there.

Flying a gunship over hostile terrain is never going to be easy, but with limited fuel and ammo, it's darned hard. The enemy is protected with Rapier Ground-to-Air missiles, chopper-busting tanks, and mobile guns - each scoring various hit points on the Gunship! Get hit too many times and it's back to base for a good ticking off!

In each campaign targets must be destroyed, but remembering what's what isn't too heavy, as the campaign map, which can be called up anytime, not only highlights where the enemy targets and defences are, it also list the targets in order as per mission briefing.

Desert Strike is an excellent game and hasn't yet been released on other formats. A great reason to buy a MegaDrive alone.





JOHN MADDEN FOOTBALL '92

ELECTRONIC ARTS ● £39.99

Another good reason to buy a Sega is this American footy game. John Madden has just made the 16-bit computer scene via the Amiga, but sadly no CPC versions are planned. The rules of American football are pretty easy to learn, but goodness knows how the play-offs and league set-ups are set.

The object of the game is to get the ball into the opponents' end zone. To do this the ball must be run over the 0 yard line in a series of plays where the attacking team given 4 chances to move the ball 10 yards. Possession is lost when the defenders intercept the ball, or after four downs, the attackers haven't moved at least 10 yards.

The Sega joypad has three triggers A, B and C. By using these, a choice of manoeuvres can be made and the ball can be thrown to three different players when play is on.

John Madden on the MegaDrive is the best implementation of American Football on any machine - so there!

POPULOUS

ELECTRONIC ARTS ● £39.99

Who wants to rule the world? Have loads of commoners and soldiers obeying every whim? Who wants to be a GOD?

In Populous you can have all these. As a GOD you must influence your people to overcome the people who support another god - your enemy. You can have influencing effects on the people of your land, building up your strength as they become more powerful. The early stages of power-building is by creating flat landscapes for your people to build castles on.

Once enough strength is created, effects such as earthquakes and flooding can be implemented to thwart the growth of your opponent. Watch out though, they are doing likewise and the gameplay becomes a race to build-up strength and disrupt the growth of the opposing nation.

It's a great game although Populous 2 could have been released instead of this earlier, less-advanced version.





F22 INTERCEPTOR

ELECTRONIC ARTS ● £35.99

This is the first flight sim on the MegaDrive. It's more of an arcade game than an actual detailed flight sim, but the dogfights and missions

HEDGEHOG

SEGA ● free with Megadrive

bonus rings which are dotted all over the landscape. Grabbing rings is not only essential to get bonus points, but when attacked, will save Sonic from losing a life. When attacked, all the rings are lost and at least one must be picked up immediately or Sonic is left vulnerable to death after any further attack! Sonic can transform creatures (and protect himself) with the Super Sonic Spin Attack. On pressing the fire button, or pushing down on the joypad, Sonic is transformed into a rolling ball, which on contact destroys everything it comes into contact with.

Sonic can run, Sonic can jump high in the sky, Sonic can spin, but the most impressive thing he can do is run fast when he gets a super speed-up bonus. This transforms Sonic's sneakers into super-sneakers. Sonic can then reach the parts that other hedgehogs just can't reach!

Sonic The Hedgehog is brilliant. It's got big sprites (characters), it's colourful, and it's fast. Top dog.







give a good feel of what the handling of the plane is like - although the aura is a long way off the real thing!

There are several different campaigns which you work through, but surprisingly enough there isn't a lot of difference between them - just more dogfighting and target selection. The dogfights are pretty exciting and will take a little on-the-spot decision making - just like the real thing, I suppose.

If it all seems a little boring, then you'd not be far off unless, that is, you are a great fan of arcade flight sims where it's exciting and action-packed. Being the only one of its kind so far, it's not a bad implementation although I think that better flight sims will be available soon.

PGA TOUR GOLF

ELECTRONIC ARTS ● £39.99

PGA Tour Golf was a celebrated hit on the Amiga, even after the huge success of previous Golf games. On the MegaDrive the game is simpler to play, but just as good. The great use of the joypad makes devices such as the mouse redundant and leaves me wondering why I initially thought a mouse was all that good an idea for games!

There are four courses in which to take on the best golfers in the world via the PGA Tour. Practice is available to perfect your game before taking on the pros, either on the course or in the driving range.

The controls are easy, club selection is automatic as you have one of the best caddies available, but it can be changed. The direction is chosen using the joypad, and then three presses of the B trigger are required to start the swing, stop the upswing, and select the slice/hook percentage. The ball travels as per ... and wind force, then the next shot is taken!

PGA Tour Golf seems to fit the Megadrive to a tee!











Oh dear...The Addams Family have been imprisoned in their lovely old mansion house...

All that is, except Gomez, whose job is it to rescue Morticia, Pugsley, Wednesday, Lurch, Thing and Granny. To do this you must brave loadsa baddies, some of which are indestructible (!), and you only have 9 lives to do it with.

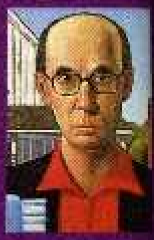
To find and release each member of the family Gomez will need to use the various Extra Life trophies, Stamina Hearts and the six coloured keys that lie scattered around the house. The keys allow access into parts of the house, in which you'll find a member of the family. Once each has been located they have to perform a survival test to prove that they aren't imposters!

The Addams Family is 128k ONLY, so all you 464 owners without expansions can sit in the corner and cry. So there. The game takes AGES to load, so take this time to read the instruction book, 'cos if you don't you ARE gonna get really stuck!!

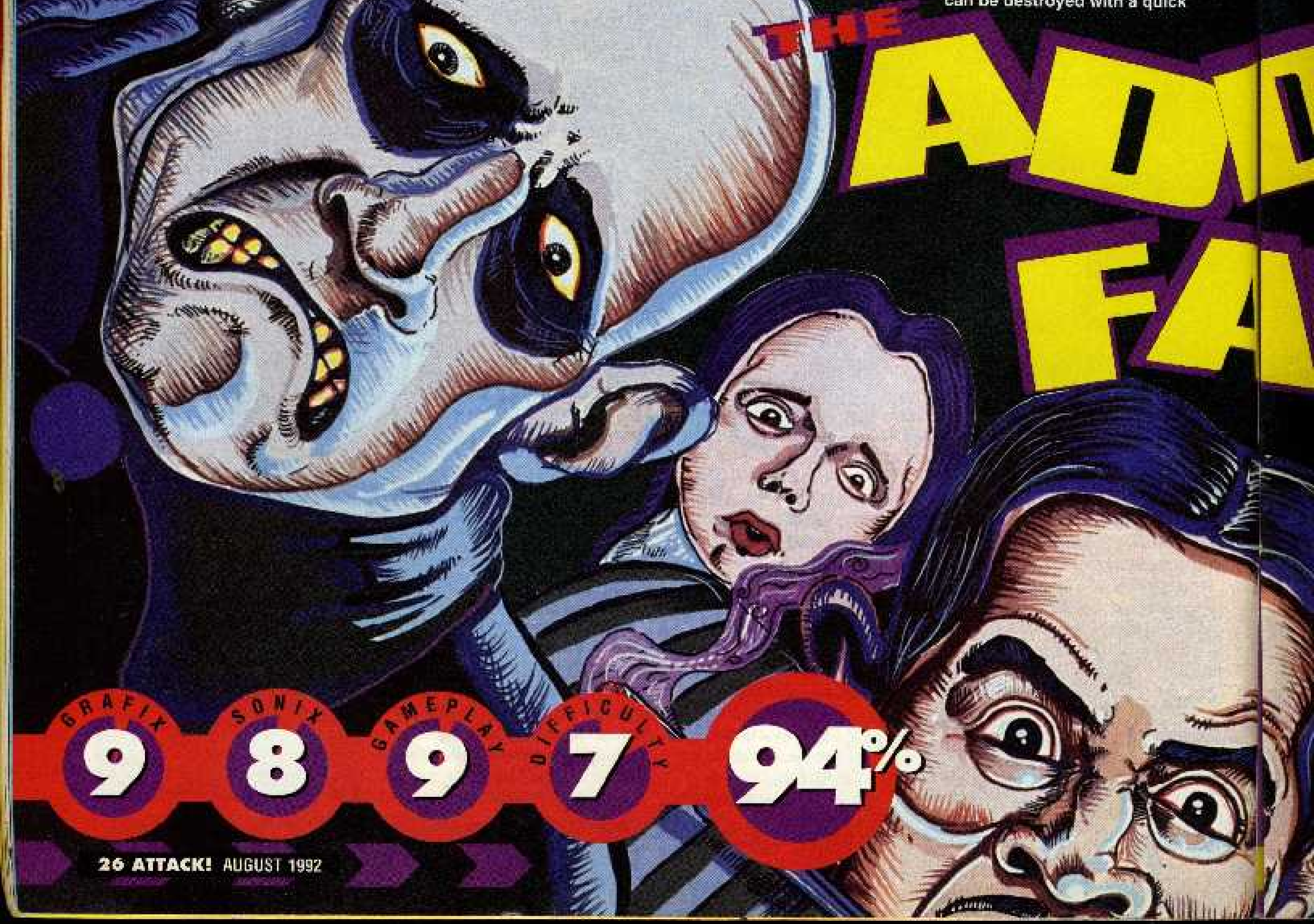
The game doesn't follow the plot of the film, but it does incorporate some of the features of it - this works out remarkably well, especially since Ocean have been criticised in the past for following the film plots too closely, ruining the gameplay. TAF is fairly reminiscent of that golden oldie, Cauldron II, because of the way some of the objects move, and also because the Flip-Screen method of moving from screen to screen is used.

In this method, instead of the screen scrolling up or down, left or right, it actually swaps from the old one to the new one, which can be quite confusing at first but you soon get used to it.

As you progress, the puzzles get harder and things tend to speed up a bit, serving only to make the game more playable! Some of the baddies (such as the Sculls!) can be destroyed with a quick



DA
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GRAFIX 9 | SONIX 8 | GAMEPLAY 9 | DIFFICULTY 7 | 94%







AMY SEZ: Well done Ocean. Somebody give them a hand!

bash to the head, but others are somewhat more hardy, and it is advisable to leg it while you still can!

The sprites are of excellent quality, and the game doesn't seem to slow down as the action increases. The music is catchy, so it's a shame that it stops as soon as the game starts. The sound FX, however, help make up for this. Gomez is easy to control, and responds well to the joystick movement. Prepare yourself for late nights and aching fingers!

DAD SEZ: Dreadful topic. I didn't watch it when I was a kid.

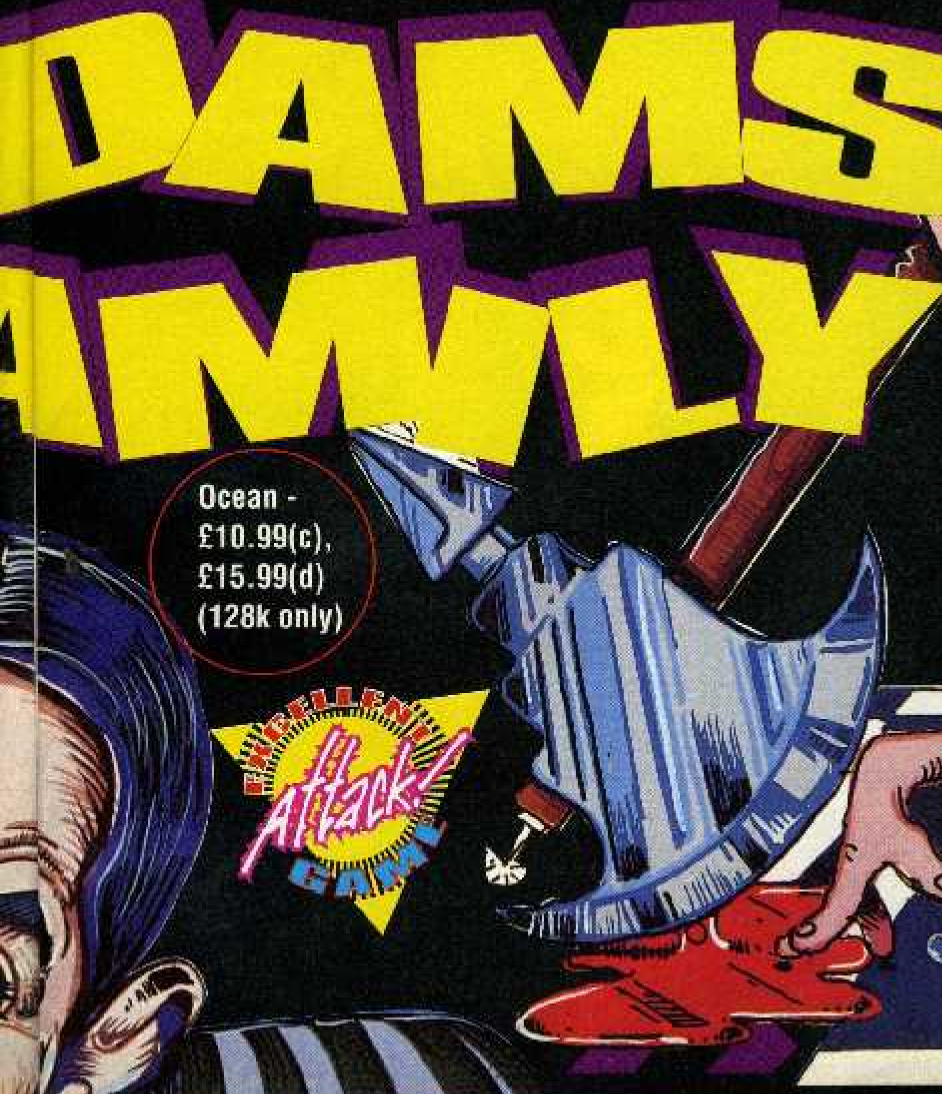
The number of ways of having your lives vanish before your very eyes is astonishing. Expect to be impaled, crushed or chopped in half, and generally despatched in any number of other morbid ways!

There are a lot of puzzles in this game, most of which require very accurate timing, so it's just as well the keyboard routines are so well programmed! It's nice to see that such care has obviously been taken in the production of this fantastic game. There are so many games nowadays that are converted straight from the Spectrum, and once in a while a game comes along that makes owning an Amstrad CPC a real pleasure.

The Addams Family reeks of quality and excellent programming which put some other full-priced games to shame.

DAMS AMLY





Ocean - £10.99(c), £15.99(d) (128k only)

THE CARTOON COLLECTION
CODEMASTERS

£9.99 [tape]

DIZZY

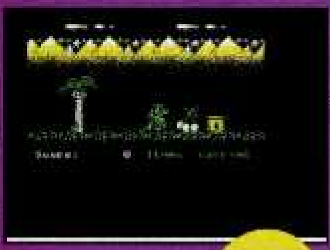


The original Cartoon classic "Dizzy" is the first in this latest set of games from the Codies stable. Still fiendishly clever, with lots of difficult puzzles to solve, this game lives on and on.

60

LITTLE PUFF

Another Codies cutesy adventure. Little Puff is lost in the big bad world, he really should have listened to his mother! To find his way back home again, he must find the four parts to an entry pass.



This game, like the Dizzy series, and Seymour, is full of puzzles, just aching to be solved, but once you've seen one Codies Cartoon Adventure, you've seen them all! The graphics are above average in this Codemasters puzzle game, and it should keep the young'uns happy!

60

SPIKE IN TRANSYLVANIA

Poor Spike the Viking, he's lost all his friends, and after an extremely rough sea crossing, he's been washed ashore, only to find that his pals are in fact locked up in a Transylvanian Castle.

10

Of course he must now rescue them, and in order to do this he must find the keys to the prison cells, where his friends are being held captive.



Unfortunately, this game won't keep YOU held captive for very long. The music is very jolly, but the graphics have been ported straight from the Spectrum, and are abysmal as is the game.

SLIGHTLY MAGIC

50

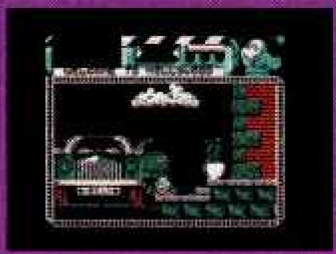


Princess Croak (with a name like that she must be hopping mad!) has been captured by the sunburnt dragon (!), and Slightly, the magician's incompetent, brain-dead nephew has been reading his uncle's spell book.

To rescue the princess, and restore things to normality, you have to collect the various spells and objects scattered throughout the land!

SEYMOUR GOES TO HOLLYWOOD

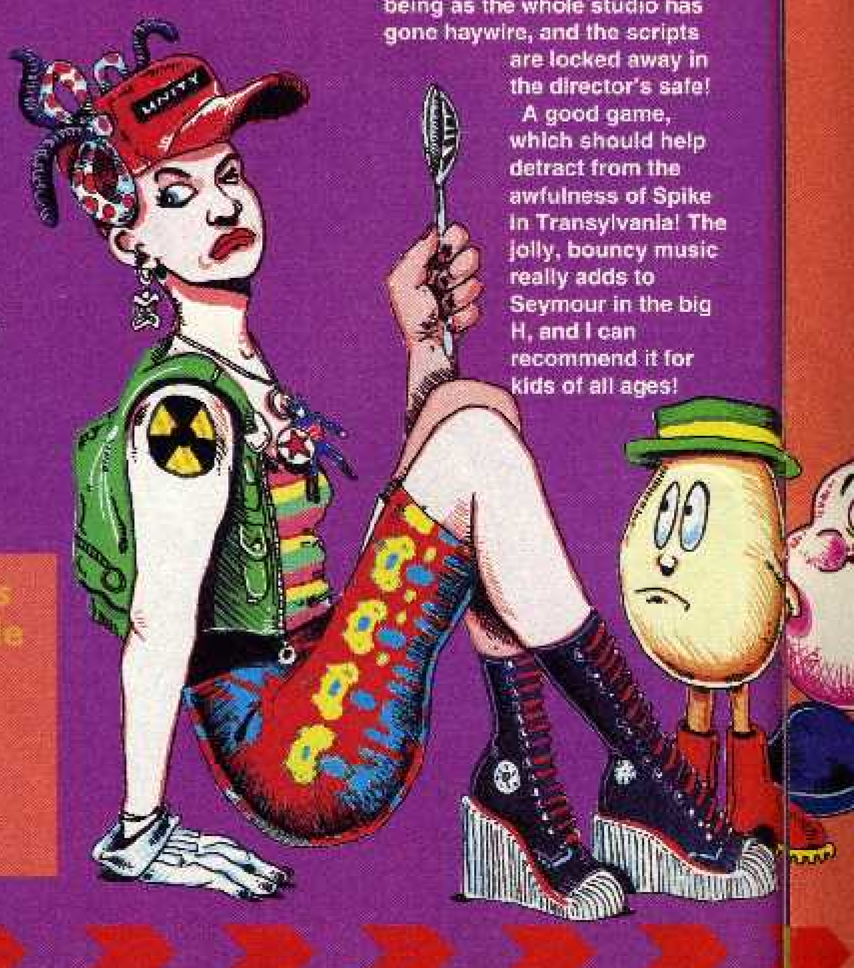
80



I liked this game. Although it has been converted from the Spectrum version, the graphics were well drawn, and, it has to be said, Seymour is VERY cute!

The object of the game is to get Seymour's movie to the box office, which is a task in itself, being as the whole studio has gone haywire, and the scripts are locked away in the director's safe!

A good game, which should help detract from the awfulness of Spike in Transylvania! The jolly, bouncy music really adds to Seymour in the big H, and I can recommend it for kids of all ages!



This pack, like the Dizzy Collection, is definitely a case of "let's get a couple of good games, and bung them in a pack, and sell it for full price". I would strongly advise buying the good games separately.

Overall Rating: 50%

THE DIZZY COLLECTION

CODEMASTERS

£9.99

Overall Rating: 60%

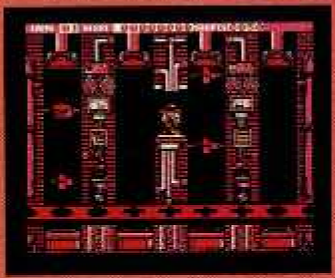
DIZZY PANIC

In Dizzy Panic you are presented with a screen with four tubes on it, out of which different shapes drop. At the bottom of the screen is a strip, which has various holes in it, cunningly designed to match the shapes being dropped. Sounds easy so far?

Well, it would be if it weren't for the fact that not only do the tubes get lower and lower as time goes by but the shapes also come out one after another, and get faster. This means that split-second reactions are needed in order to get the strip in the right position for the shape to fall through. Too late and you lose a life.

A clever game, but gets too hard sometimes, and the Dizzy theme does appear to have been added just to sell the game.

30%



SPELLBOUND DIZZY

This is the first Multiload Dizzy I have ever seen. It is also the largest, in terms of playable screens - there are over 100! Dizzy has managed to transport his pals and the Wizard Theo to the underworld, by reading out a spell from one of Theo's magic books!



70%

The object of this game is to collect five rotating stars and a special object, in order for Dizzy and the Yolkfolk to be transported back home. On a CPC 6128 the levels load into the extra 64k, and this takes AGES. Time to prepare the Sunday roast.

With more than 100 screens, you are going to be busy for a little while to come with this one! Whether or nor you're a Dizzy fan this game is well worth a look, and should keep you occupied for many, many hours!

MOTHER SEZ:
Nice and simple, but isn't there better things to be done child!

DIZZY - PRINCE OF THE YOLKFOLK

This is the smallest Dizzy game ever produced, it has around thirty playable screens. Dizzy has been imprisoned by Rockwart the troll, and Daisy has fallen into a hundred-year sleep (probably been playing Dizzy down the Rapids!)

Nothing at all spectacular about this Dizzy cartoon adventure. It looks as though it has been added almost as an afterthought to the collection.



30%



DIZZY DOWN THE RAPIDS

This is a Toobin' clone in which you are either Dizzy or Daisy floating downstream in an apple barrel while trying to avoid various objects such as alligators and those most dangerous and terrifying of all monsters, butterflies (!). These baddies can, however, be dispatched with a few well-thrown apples.

The game is repetitive and boring, the best bit being the tune, which is most awesome by comparison.

20%



AMY SEZ:
If you are a Dizzy fan, then this collection of classics is worth buying for KwikSnax and SpellBound Dizzy alone! If not, then steer well clear.

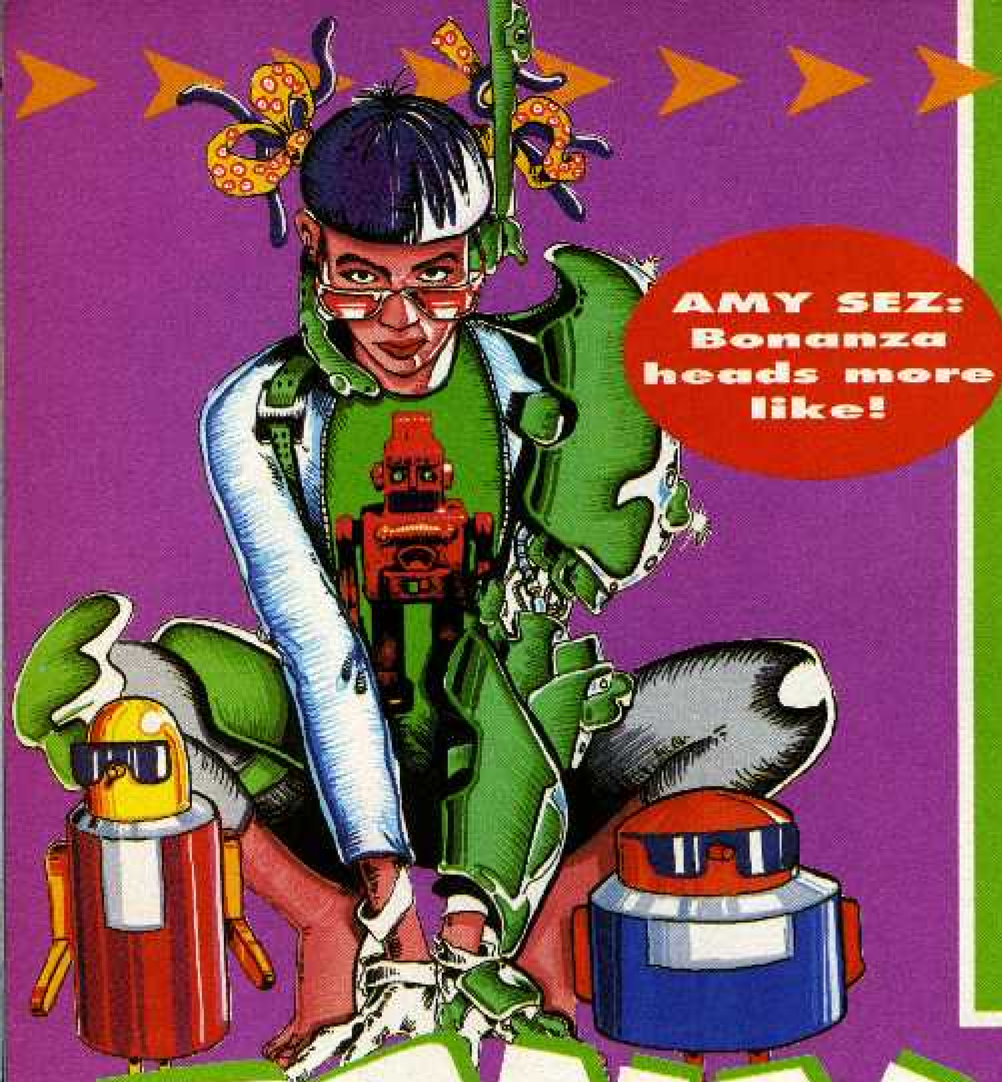
KWIKSNAX

This game is another Dizzy that isn't! For a start it's in a very colourful MODE 0, and the graphics are of a very high quality.

The Evil Wizard Zaks has cast a spell that has sent Dizzy's little friends all over the place. In order to get them back, you must visit the various lands, and destroy Zak's henchmen by squashing them with blocks, and collecting fruit. This is the kind of Codies' game I would like to see more of.

60%





BUDGET

BONANZA BROS

US GOLD - £10.99(c), £16.99(d)

Forget the Blues Bros, forget Goss Bros, you can even forget Moss Bros, 'cos the Bonanza Bros have hit town. After waiting and waiting you can now get your paws on the dustcans with the Chicago patter and the New York tec-look. There's Robo tec-head, the pot that's the swot and then there's Mobo block-head, the pot that's not. Okay, okay; one's clever and gets by on clever sleuthing, the other is dumb, but uses his thump to get the Bros out of tight spots.

A top nob has invested lots of dosh setting up a fail-safe security system for his many businesses. He's just hired the Bros to test out his security and has placed some goodies in several of his premises. There's eight objects on each level, and 10 levels in all, so there's plenty of stealing to be done.

The security is made up of guards and bouncers. There are several types of guards, from easy to darn impossible - the guard dogs must be got past very quickly. The objects of concern flash - no wonder this guy gets ripped off - so they're easy as pie to spot. They're also very accessible and there's no digging, pushing, or destroying to be had. The only action that's needed to steal them is to jump onto the platforms where they stand. The guards aren't too smart and are easy to stun with the unlimited supply from the boys' stun guns.

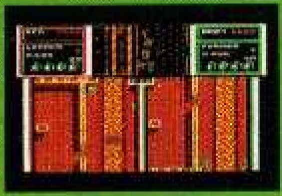
The two player version is handy, and can get two decent players a long way in the game, but care is needed for the Bros not to take each others space, as there's only limited hiding/dodging spaces from the guards. On the one player game, lives are more precious as there's twice as much work to be done.

The gameplay doesn't differ

GRAFIX	SONIX	GAMEPLAY	DIFFICULTY	
7	7	7	6	66%



CRACKDOWN - KIXX - £3.99

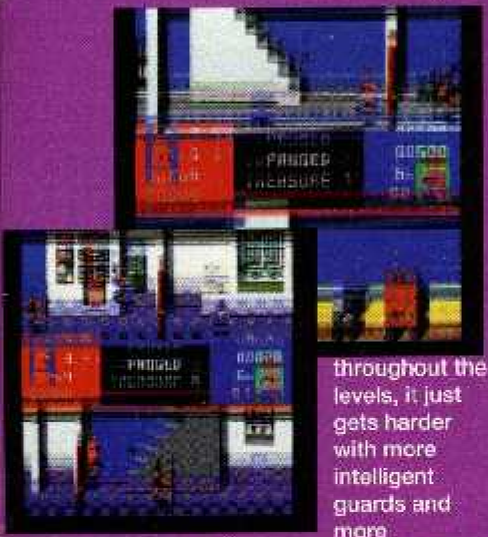


Don't we all hate drug barons, dealers and Ecstasy suppliers. Yeah, let's crack down on these slimy creeps once and for all. Andy and Ben had a dream (ding); to blow up the local factory - where all the evil happens - and thus ridding the world of all its crap in one go. That's where we're at with Crackdown.

The first noticeable flaw about Crackdown is that it won't run on my CPC PLUS, but will work on a bog standard CPC. However, it was programmed pre-PLUS and can't really be blamed for Amstrad's quirks. It's played from overhead - just like Gauntlet - with either one or two players slogging it out in the factory grounds of the evil Dr K.

There's just not enough in this game to warrant a higher rating, but it's not bad if you're a fan of these blaster types.

RATING:	72%
GRAFIX:	8
SONIX:	6
GAMEPLAY:	7
DIFFICULTY:	5



throughout the levels, it just gets harder with more intelligent guards and more obstacles. The controls aren't that superb and this, more than anything else, is infuriating. Getting Robo or Mobo to jump and move is a little too tricky at times!



All in all it's disappointing to see that after all the good games that've been out for the CPC, Bonanza Bros doesn't make the grade as a top game, which is a shame as the CPC doesn't get many releases.

PARENTS SEZ: After the first two levels it gets too hard for young children!

ESCAPE FROM THE PLANET OF THE ROBOT MONSTERS HIT SQUAD - £3.99



Phew! This must be one of the games that would win an award for the longest title. Take a planet, fill it with robots (weet-a-bix ones at that), add a few human captives, a doctor (preferably female), a couple of rescuers and you've got the plot to a good B-movie, or a good computer game - and that's what EFTPOTRB (phew!) is.

The plot is so amazingly simple as to be believed by 50% of America's population. With one or two rescuers, you save the professor, who's been kidnapped and taken to Planet X to build a super-duper weapon. Along the way you can also rescue the hostages who will otherwise be transformed into RoboZombies.

I don't know if I would have paid full-price for this, but it's a definite bargain on budget.

RATING:	86%
GRAFIX:	8
SONIX:	7
GAMEPLAY:	8
DIFFICULTY:	6

SKATE WARS HIT SQUAD - £3.99



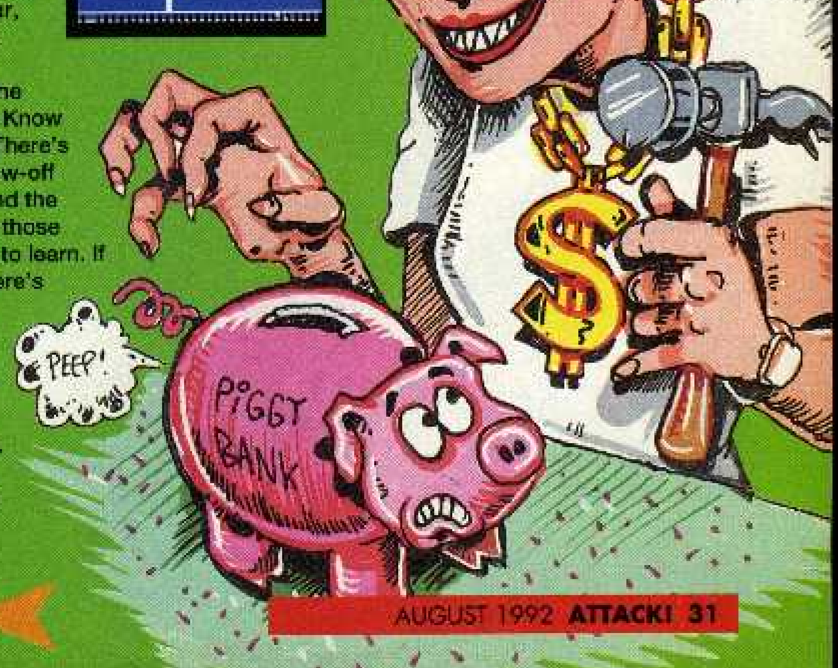
Don't know about you, but I just detest ice-skating. Wot with trying to stay on your feet for the first hour, impersonating Bambi while holding on to the barrier's edge. Know what I mean? There's always the show-off who flies around the rink disturbing those who are trying to learn. If you ask me there's nothing more boring.

However, ice hockey is a different matter entirely. Bashing and fighting. Skate Wars is a little reminiscent of the one-to-one's, but instead of just fighting, you can kill your opponent by forcing them into the deadly spikes. There's a goalkeeper and a striker to each team, with two substitutes. The striker is human-controlled while the computer looks after the goalkeeper. When a striker hits an obstacle on the screen that he shouldn't, he dies. Then a substitute is brought on etc. When there are no subs left, the game is awarded to the team with the most points/goals, so it's not only goals that count, but they help!

Like most budget games, Skate Wars isn't bad for the dosh, but I could find better things to do with my play-time.

RATING:	56%
GRAFIX:	7
SONIX:	5
GAMEPLAY:	4
DIFFICULTY:	4

AMY SEZ: Break open them piggy banks and get get down to the shops



Attack! TOP 50

GAMES CHART

	GAME	COMPANY	CASSETTE PRICE	DISC PRICE	RATING	
1	LEMMINGS	PSYGNOSIS	£15.99	£19.99	98%	
2	PRINCE OF PERSIA	DOMARK	£10.99	£15.31	97%	
3	SMASH TV	OCEAN	£10.99	£15.99	96%	
4	RICK DANGEROUS	KIXX	£3.99		95%	
5	RAINBOW ISLANDS	HIT SQUAD	£3.99		95%	
6	TURRICAN II	KIXX	£3.99		94%	
8	CONTINENTAL CIRCUS	TRONIX	£3.99		94%	
9	THE ADDAMS FAMILY	OCEAN	£10.99	£15.99	94%	NEW
10	NORTH & SOUTH	INFOGRAMES	£9.99	£14.99	93%	
11	HUDSON HAWK	OCEAN	£10.99	£15.99	93%	
12	TURRICAN	KIXX	£3.99		93%	
13	TITUS THE FOX	PALACE	£10.99	£15.99	93%	
14	KICK OFF 2	ANCO	£10.99	£16.99	93%	
15	STRYKER	CODEMASTERS	£3.99		93%	
16	WWF WRESTLEMANIA	OCEAN	£10.99	£15.99	92%	
17	G-LOC	US GOLD	£10.99	£15.99	92%	
18	F-16 COMBAT PILOT	DIGITAL INT.	£6.99	£10.99	92%	
19	RBI BASEBALL	DOMARK	£10.99	£17.99	92%	
20	IMPOSSAMOLE	GBH	£3.99		92%	
21	IK+	HIT SQUAD	£3.99		92%	
22	SPACE CRUSADE	GREMLIN	£10.99	£15.99	91%	
23	TERMINATOR 2	OCEAN	£10.99	£15.99	91%	
24	PLOTTING	OCEAN	£24.99 (cart)		91%	
25	MAN.UNTD EUROPE	KRISALIS	£11.99	£16.99	91%	
26	OP.THUNDERBOLT	HIT SQUAD	£3.99		91%	
27	POWERDRIFT	HIT SQUAD	£3.99		90%	
28	CHASE HQ	HIT SQUAD	£3.99		90%	
29	PRO TENNIS TOUR	HIT SQUAD	£3.99		90%	
30	HEROES OF THE LANCE	KIXX	£3.99		90%	
31	SUPERCARS	GREMLIN	£9.99	£14.99	89%	
32	STUNT CAR RACER	KIXX	£3.99		89%	
33	CASTLE MASTER	HIT SQUAD	£3.99		89%	
34	ROBOCOP 2	OCEAN	£24.99 (cart)		89%	
35	PUZZNIC	HIT SQUAD	£3.99		88%	
36	LICENCE TO KILL	HIT SQUAD	£3.99		88%	
37	BATMAN - THE MOVIE	HIT SQUAD	£3.99		88%	
38	NAVY MOVES	HIT SQUAD	£3.99		88%	
39	LOTUS ESPRIT TURBO CHALLENGE	GBH	£3.99		88%	
40	HERO QUEST	GREMLIN	£9.99	£14.99	88%	
41	SHADOW WARRIORS	HIT SQUAD	£3.99		88%	
42	SIM CITY	INFOGRAMES	£9.99	£14.99	87%	
43	ROBOCOP	HIT SQUAD	£3.99		87%	
44	NEW ZEALAND STORY	HIT SQUAD	£3.99		87%	
45	DRAGON NINJA	HIT SQUAD	£3.99		87%	
46	ESCAPE/ROBOT MONSTERS	HIT SQUAD	£3.99		86%	NEW
47	GHOSTBUSTERS II	HIT SQUAD	£3.99		86%	
48	OUTRUN EUROPA	US GOLD	£11.99	£16.99	86%	
49	GAUNTLET II	KIXX	£4.99		86%	
50	BARBARIAN 2	OCEAN	£24.99(cart)		86%	

GALLUP TOP 10
FULL PRICE CHARTS

	LAST	GAME	COMPANY	CASSETTE	DISC	RATING
1	2	WWF WRESTLEMANIA	OCEAN	£10.99		92%
2	1	DIZZY'S EXCELLENT ADVENTURES	CODEMASTERS	£9.99		
3	4	TERMINATOR 2	OCEAN	£10.99	£15.99	91%
4	3	CARTOON COLLECTION	CODEMASTERS	£9.99		50%
5	5	SPACE CRUSADE	GREMLIN	£10.99	£15.99	91%
6	8	THE SIMPSONS	OCEAN	£10.99	£15.99	
7	6	DIZZY COLLECTION	CODEMASTERS	£9.99		60%
8	-	BADLANDS	DOMARK	£9.99		
9	-	HUDSON HAWK	OCEAN	£10.99	£15.99	93%
10	-	THE NINJA COLLECTION	OCEAN	£9.99		

GALLUP TOP 10
BUDGET CHARTS

	LAST	GAME	COMPANY	CASSETTE	DISC	RATING
1	4	BUBBLE BOBBLE	HIT SQUAD	£3.99		
2	6	NEW ZEALAND STORY	HIT SQUAD	£3.99		87%
3	5	RAINBOW ISLAND	HIT SQUAD	£3.99		95%
4	7	SEYMOUR GOES TO HOLLYWOOD	CODEMASTERS	£3.99		80%
5	9	MAGIC LAND DIZZY	CODEMASTERS	£3.99		
6	3	ROBOCOP	HIT SQUAD	£3.99		87%
7	1	GOLDEN AXE	TRONIX	£3.99		
8	8	BUBBLE DIZZY	CODEMASTERS	£3.99		
9	-	PUZZNIC	HIT SQUAD	£3.99		88%
10	-	HARD DRIVIN	HIT SQUAD	£3.99		


The Addams Family


attack!
ocean

POKES MAPS & TIPS

It's never been this good before...

It's all here, and if it isn't to your liking, it soon will be, dude. Most of this section will be supported by you. That means I'll help where poss, but if you don't write with help, then how do you expect others to do it for you? I'm on the prowl for maps, multiface pokes, and tips.
I also want the CORRESPONDENCE pages to be supported. If you don't support it, then nobody else will.

GOT IT? GOOD!



KEY PRESSES

from
Mohamad Jeetooa,
Robert Kershaw,
Andrew Toft

BACK TO THE FUTURE II
Press ESC to skip Level 1 (464 only)

BLAZING THUNDER
Hold down the keys s,l,i,m,e on the options table for infinite lives

CHASE HQ
Redefine keys as s,h,o,c,k,e,d then press:
1 - RESTART, 2 - SKIP A LEVEL, 3 - END GAME DISPLAY, 4 - EXTRA LIFE.



CISCO HEAT
Hold down all keys to skip levels (WHAT????)

HONG KONG PHOOEY
Hold down the keys t,h,u,g,i on the options table for infinite energy

IK+
Press K to skip levels



MIDNIGHT RESISTANCE
Press R,G,N simultaneously for infinite lives. CTRL will also kill the end of level opponents

SCOOBY AND SCRAPPY DOO
Hold down the keys h,e,l,p on the title screen until it is white. You now have infinite lives

SLUG
During play, press the keys h,b,n and m to skip a level

YOGI'S GREAT ESCAPE
Press the keys i,c,e on the hi-score table for infinite lives

CORRESPONDENCE

**Each month, we get loads of mail from readers requiring help on games.
Well, we just can't do it, but you can. Every month we'll print the REQUESTs for help with a special code, and if anyone out there can help then write in with your RESPONSE. Please quote the reference number of the REQUEST you're RESPONDing to.**

Got it? Good.

ATTACK! REQUESTS

GARFIELD [AU1]
I can't go anywhere without getting hungry and eating the key to get to the pound. How do I do it?

SORCERY [AU2]
I keep running out of power on level 2, it's well 'ard. Can anyone give some advice?

GHOULS AND GHOSTS [AU3]
Has anyone got a cheat for this game?

IMPOSSAMOLE [AU4]
I can't get past level one. Can anyone suggest a cheat for infinite energy or a map for the disc version?

ATTACK! RESPONSES

DOUBLE DRAGON 2 [JN4]
I have a great infinite lives cheat. Press Del, to pause the game, and type RUN LIKE HELL (including spaces). I'm afraid this is disc only, but it may work on tape versions. Try it!!!

BARBARIAN [JN2]
I suggest that on the first level, you roll along the ground, knocking down your opponent and trap him in the corner. Then pull the joystick in the opposite direction you are facing and press Fire (this will attempt to chop off his head). It will take a while but the head will eventually come off. On later levels, get your opponents in the corner and pull down and fire. This should kill them.

Learn and memorize all the moves as normal and in reverse. On the first man, keep hitting him with flying neck chops and he'll eventually die. The second man can be killed by "rolling" him into the corner and leg chopping.

RENEGADE [JN3]
On level 2, as the motorbikes enter onto the screen, give them a flying kick - that's the best way to destroy them. Practice makes perfect! After disposing of them, go right and face the wall. As the baddies approach, just press the left button (to do a back kick). This should beat all of them - including the Boss!!! If you have a multiface then type ADDRESS 0FBB, POKE FF for infinite lives. Also, you can try out ADDRESS 0FE1, POKE FF

from Damien (GamesMaster) Jackson who has also vowed to help when he can. So for that Damien wins a prize - any full-price game I can get my hands on! Give us a call Damien with a wish-list.

MULTIFACE POKES

from Andrew Tait, Lee Rouane and Stuart Joplin

CABAL (T)	1972 00	Infinite Lives
CONTINENTAL CIRCUS (T)	2763 00	Infinite Continues
	0B86 00	More Time
RAMBO 3 (T)	18A6 00	Infinite Continues
RICK DANGEROUS (T)	89C3 A7	Infinite Lives
	9F35 A7	Infinite Bullets
	9F90 A7	Infinite Dynamite
BARBARIAN 2 (T)	432F 00	Infinite Lives
BATTY (T)	4518 00	Infinite Lives
PSYCHO HOPPER (T)	03C3 00	Infinite Lives
RAMBO 3 (T)	1866 00	Infinite Credits
R-TYPE (T)	927D A7	Infinite Credits
MIDNIGHT RESISTANCE (T/D)	1557 00	Advance a level after death
SEYMOUR GOES TO HOLLYWOOD (T)	61C8 00	Infinite Lives
MIG 29 SOVIET FIGHTER (T)	08C8 00	Infinite Lives
	0CF1 00	Infinite Fuel
SHADOW OF THE BEAST (T)	2920 00	Infinite Energy

TIPS

SEND ALL REQUESTS TO:
CPC REQUESTS
& RESPONSES TO:
CPC RESPONSES
at:
CPC ATTACK!, HHL Publishing,
Floor 3, Greater London House,
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NAVY MOVES
from Robert Kershaw
The password for level 2 is 28750

ERIC THE VIKING
from Dominic Corby
If you are offered a chalice by the Enchantress, throw it at her - she melts



TITUS THE FOX
from Dominic Corby
The password for the dungeon is F4F8



IK+
from Robert Kershaw
When your fighter is knocked down, press pause (ESC) and unpause to be ready for action

RAINBOW ISLANDS

Last time, we showed you how to wield your joystick through the first four levels of Taito's Rainbow Island. Well, now we're going to lay waste to islands 5 and 6. Complete control or wot?



[5]

DOH'S ISLAND

The fifth island and starting on round 17.

5.1 It's a magical place, and to prove it there are occult sigils on the walls, or to you, chicken tracks. Following the yellow brick (what else?) walls, you rise through the levels, hopefully faster than the water does.

Notoriously bad for the occult, is running water.

There are loads of things to look out for in this island. It brims with pointy hats which float around without the aid of a robed wizard underneath. Dice with the red cubes, which have a habit of going underneath you and then rising, and square up to weird green triangles of the type usually seen when coming round from an anaesthetic.

Touching any of the above is terminally fatal. Of course.

Anyway, the first round is all about getting your eye in. Just hop up onto the left side of the platform above you and blast a rainbow through the nearest red star. Most of the nearby moving bits then turn into fish, and then edibles.

Boiled eggs? Ice lollies? Potted plants? Strawberry sundaes? Chocolate bars? Methinks the mystic mages have been overdoing their portion of magic mushrooms.

No matter, this is the part of the island where you quickly learn never to leave a red cube behind you. Their circling search pattern will get you in the end. The end you didn't want them to get you in.

Some cubes even go freelance, homing in on you. They are a real pain in the end.

Wait for the cubes to approach, and zap the other star with a rainbow. Collect the gems, and gloat on your way up.

There's a box-like series of platforms with nothing significant in them, but at the top are a couple of pointy hats sans wizards, and two pairs of cubes on the rampage. Let the first pair pass below you as you leap onto the next platform, and drop rainbow fragments on them. The hats are easy and can be mopped up afterwards.

A little higher up are two bits of platform curled inwards like boar's tusks. There are a couple of hats in there, but not much else. However, cuboids lurk at the top. Plenty of room for manoeuvre here though, and the cubes can be diced by direct fire.

Above this dismal screen are some blue, purple, and green platforms, one of which bears a bar of chocolate. Jump onto the purple platform in the middle, and zap the green triangle affairs from there. Then you get the choc bar.

This seems to upset a whole horde of green triangles who then drift down towards you. They don't home in terribly well, so stay in the middle and keep firing.

Above them are a few more of the red cubes. They guard a series of stepping stones which lead out of this round. Rush the first step, as it has a red star on it. Get that, and the opposition

bites the dust. There are a few more red stars on the stepping stones, so keep going. At the top, build a bridge and leap to freedom.

5.2 Round 18 starts off with you standing on a beautiful rainbow bridge, narry a meanie in sight. Yes, there is a catch: above the next platform are more triangles and cubes than in a Picasso's portrait of a cubey-triangley sort of thing.

They take a while to penetrate the maze of blocks, so go over to the right, jump up one level and shoot all commercil on the left. Repeat three times until all the sinister shapes are shot.

Bridge and jump up to the next batch of three platforms now, where you meet a load of balls, coloured balls. These tumble all over the shop, with no easy way to take them out (if you ignore Amy's helpful suggestion involving a sawn-off shotgun).

Start off on the left-hand platform and blast right, which gets a lot of balls, then jump up onto the rainbow to dodge the balls and cubes coming down on the left. Drop rainbows on them.

Trapped within the narrow confines of the next two platforms are four bouncing balls with nothing to sustain them but a couple of jellys. Leap in on the left and put them out of their misery in mid-air.

On top of those are a few triangles and another of those balls. Plenty of space to take them out in, so do it while you're building your way up out of this round. Start in the middle, and it's easier to take a breather on a platform half way up on either side. Collect free choc bars.

"Yes."

"Can you see into the future?"

5.3 Crystal balls are the next fate awaiting you. They fly in on the diagonal and bounce aimlessly around, though you'd swear it was slightly biased. They're fairly predictable, and only of nuisance value. On the first screen of round 19, just move left, and they'll bounce off elsewhere while you hit the balls, which come from both directions.

Once all are slain, move on up, but stick to the left edge if you can. Rotating red squares home in on the grey platform, so don't be near it. Go up to the yellow platform and withdraw - they'll follow you. Then you can despatch them with some ground underneath you.

This round has an awfully high ratio of fresh air to platform, so if you don't kill baddies at the bottom, you'll miss most of the bonuses; there simply isn't anything for the flying fish to settle on. The scenery doesn't change much either, so get used to it.

The rotating red squares knacker rainbows, which is a problem as you spend most of this level perched on 'em. So when you see a revolving red rectangle, make for the right-hand side: the furthest you can fall there is onto the last screen number.

Two other useful tips about red squares: First, they can come down edge on, so look out for practically invisible red bars coming down, and secondly they will disappear through the edge of the screen instead of bouncing back.

So just blitz your way up the right-hand side, hopping from screen number to screen number. Hop INSIDE number 2, not on top, or you'll be crystal balled. You also end up on just the right level to take out a revolting, sorry revolving, red square.

Number 3 is also a good place to be inside. Do not be lured out after that collection of juggling balls, and don't linger there too long or you'll be cut to rainbow-coloured ribbons by the squares either way. I counted five of them; far too many. Lure them down and dodge round them.

It's not a very long round though, and you can make it from bottom to top very quickly once you've cleared all the nasties out, so don't worry about falling.

5.4 Now for round "blind 20", as they say in that real-world game called bingo. Many more platforms here, and the spinning pointed hats are back.

Firing triple rainbows, you can clear everything on the bottom row with one shot, except maybe the aforementioned pointy hat. All is now well until you draw level with the two green platforms, when a couple of crystal balls drop on you. You have been warned! Jump!

After these, come three red squares. Try staying mostly over to the left (after killing the pointy hat), leaping up and taking them out with crossfire.

Come up on the left, and dodge the first crystal ball that comes your way. He and a few friends will then get trapped in a maze in the middle. Amaze them by taking out the whole lot with one shot.

As you go up, try to stay central, and look out for the horde of red squares after about half a screen.

Not far past this is a dash-like row of double platforms guarded by a green triangle and so many coloured balls it looks like a snooker game. Above this is home! Be prepared for a last minute onslaught by a trio of squares, and you face The Mask.

Trickyish, 'cos he's up there, you're down here, and there aren't any platforms between the two.

He's making it hard for you by spitting out little red squares. The tactic is to dodge the squares while he's firing, and while he gets his breath back, dart in and blast with the rainbows.

[6] ROBOT ISLAND

Robotic Revenge: It is the island of the robots. Robots are superior beings. Humans will be exterminated. Ex-ter-min-ate, ex-ter...

Ahem, sorry about that. Dunno what came over me. Never mind, let's get on with Robot Island, shall we?

First, remember this: From this island on, you can't buy a new game from the current level, no matter how many lives you have, or however many credits you pumped in. Dead is dead is it. Go get a Multiface.

The landscape here is a joint effort by Lego and Meccano; red girders interspersed with cogs and gizmos with names like "a 3/8ths Gripley." Goodies are your favourite selection from the sweet shop, guaranteed to make any kiddie go hyper.

Trying to stop you getting the sweeties are green-faced robots who fire missiles, heads-only robots with flames coming out their necks, and loose screws. Loose screws have always been my problem, or so I'm told. Anyways, in Amy's words, let's go slime us some rustbuckets.

6.1 Round 21 has a load of invisible goodies to the

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right at ground level including, I think, magic shoes. Zap those, and leap onto the centre platform to get the guy with the green face. He doesn't fire very often, and his missiles shouldn't be hitties, but he brings a couple of loose screws, so dive for the edge, trap them under rainbows, and drop on them.

Hot on their tails are a couple of the heads-only robots. Unlike the screws, these are easily held up by solid objects. Hide on one side of a platform, and poke them on the other side in safety.

Going up, don't miss the red star before the green rocket-firing greeblie. He may avoid the shrapnel but is easy to finish off: rainbows hold up the rockets. His two screwy friends come down the centre, so be sure to look out for them after his demise.

At the number two marker, two heads-only critters come down at you. Dart over to the short platform at the lower left, and blast them through the centre wall.

Above the stubby T-shaped platform, there are two screws and a couple of heads. Try to go up on the left, as you are less likely to fall down as you leap up and down zapping them, and it takes a while for the screws to drift over.

At the number three marker, go up the right edge to trap three flame-heads against the central platform with the strawberry on top. Stand on a rainbow and blast the beggars.

Then, thread your way past a pair of screws to home, and in come the sweeties!

6.2 Round 22 starts off with a few ice-creams and a bit of peace and quiet. Then, just one platform up, a spanner flys into the works. Don't get hit by the spanner or you won't work.

The spanner is a mere sideshow to the three rocket-firing greeblies above. Wait until the lowest one has fired, close, and kill. Jump onto his platform and shoot the beggars to the left and right unless the spanner gets close, but you're quite likely to hit that by accident what with all the rainbows you'll be cropping. Another spanner drifts down while you're doing this, by the way.

Move up to the three block wide platform to left of centre and shoot greeblies to the left and right: they can't hit you there. Use your rainbow as a bridge to go right and clean up all the ice-creams.

On the centre platform are two greeblies. These are easy meat from the platform on the right. On the left, are two nuts. A good reason to stay on the right. These home in with great accuracy, so make sure you have a clear shot at them.

There's one more greeblie before the number two marker, and you can hit him by bouncing on the platform below, shooting at the top of the bounce.

The two rocket-firing greeblies and their pals the spanners are a mite more difficult. Bounce up to the side of the lowest greeblie, and shoot him on the hop. Two nuts will drop on you and you hit them in the same blast. Stand on the platform where he was to hit the greeblie on the right. By now, the spanners are there and with a bit of luck, you get them at the same time. So when you get to the red star that's hanging above you, you don't need it. Life, don't talk to me about life.

Make the best of it: use the damn thing to take out the two greeblies on the centre platform.

Jump up on the platform to the right of the next greeblie, but plug him quick or a metal nut hits your wooden one. Jump up onto your rainbow and drop rainbows on it.

Now life hots up, 'cos while

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LEVEL 6.1

you're doing that, two spanners are closing in on you. Head for the left side and pick 'em off if they close.

You don't have to hit the next greeblie, and as you're running low on time by now, you might as well ignore him and hope that something nasty drops in on him as you clip the next greeblie.

Like last time, hit him quick because he's guarded by a couple of nuts and spanners. Most things come undone when hit by a spanner, and you're no different. Still, removing the last greeblie left you with a nice, clear killing field to wipe out the nuts in.

You can tell you're near the end; everything is dropping on you again. More nuts fall, and you kill them by sticking to the left wall and zapping them as they home in.

Two more follow; dodge or kill according to your temper. The final greeblie can be zapped from the central platform, and it's fresh fish tuck-shop time.

6.3 Seconds out, round 23. Ding! A great start: dive-bombed by three flame-heads simultaneously. Take a flying leap onto the left-hand platforms, face right, and pick them off as they come in like the suckers they are. That's the lot for the next screenful or so, when a platform crosses the screen. Here, two pairs of spanners are trying to drive you nuts, but you can leap up and down in the large space provided, and sockit to them.

But, while you're going up and down like a yoyo, two screws and a couple of flame-heads come down. The screws can wait, but the flame-heads have to be taken out first as they can travel through walls. Block the entrance with rainbows, and stand on one lower down. When



ISLAND 6 / FINAL LEVEL


LEVEL 6.2


LEVEL 6.3


LEVEL 6.4

the flame-heads pause, jump up to blast them. If you're lucky, you'll get the chance to snipe at the screws from the safety of the enclosed area while hunting flame-heads.

All is now quiet until the level two marker, when four bolts, two spanners and a trio of flame-heads invite themselves down for a party. The main danger is from flame-heads, especially since there is not much platform to manoeuvre around on. Start from the right, trying to clear the screws and spanners away from the centre, and intercept the flame-heads there.

Them done, and it's no picnic, wend your merry way to the level three marker avoiding the spanners. They could be anywhere, so I can't give specific instructions here. But what I can warn you about are the three flame-heads that try to take you out just before the marker.

The best way to deal with flame-heads is to stick to an opposite wall with a big, clear space to one side. The flame-heads move into it, and you put their fire out. For this lot, the single-square platform just below the number three is about right, but you have to draw them out into the centre first.

Onwards and ever upwards is an assortment of ironmongery with one easy solution: Stand on the purple platform on the right, and zap it all as it floats past. Money for old iron, that part.

Moving towards the gap above, you'll find some screws and flame-heads. I always ended up trapping them below the gap, and dropping rainbows on them. What the hell, it worked for me.

There is another flame-head in reserve though, but you've plenty of room by the time he arrives, so leaving a leisurely stroll to the top of the round and start of the next.

6.4 For once, you only get two foes on the first screen. Go for the flame-head first, standing on the left until he comes to you. The spanner will do the same, but won't make it through the rainbows so you'll have to go get it. The two rocket-firing greeblies letting off a Guy Fawkes display over your head can be clipped if you stand on top of a rainbow on the centre platform. Easy, but don't get too cocky.

Two screws bolt out of the blue towards you, so stand on the right-hand platform and get some easy points.

Now the game gets its revenge, and drops nuts on you but there is a way out! One of the screws drops a rapidly disappearing magic ring. This gives you magic maxi-sorta mega-lethal jumps or, to put it another way, a licence to make points. Every time you jump, things die and your points go up. You are invincible, unless you do something really stupid like stand still. However, this is subject to a time-limit.

Life is now easy so make the most of it: cruise past the level three marker, and grab a full set of crystals for an extra life and huge bonus. If you get as far as the top, well done, but you'll probably only make it as far as the last pair of greeblies. Only? Who are we kidding? Bounce up onto the left-hand platform level with the greeblies, shooting rockets, and skilfully dodging any falling nuts. Blast greeblies to puree.

Above him is a single greeblie, easily got by zapping him from the platform underneath. Lure the flame-head down first, though. One of them (sorry, I moved too fast to tell which) turns into a red star. Not the same kind of wholesale slaughter you've just witnessed, but it gets rid of the screw.

Moving on up, the platforms get scarcer and more nuts drop on you. Stand on the left and take pot-shots as they drift idly by. Lure down the flame-head with the same casual ease, and splatter the turkey.

Only one lowly spanner, and you face the big, mean, green greeblie with more rockets than Rambo.

Fire rainbows into him until he has chased you half-way across the screen, then move to the upper platforms. When he's half-way across those, move down. Repeat until one of you snuffs it.

NEXT MONTH The guide proved to be bigger than both of us, but fear not `cos next month will see the last level conquered!

Apologies

In the July issue, an article was printed in which unjustified and grossly incorrect statements were made regarding Amiga Power, Future Publishing and the ABC system. CPC Attack! would like to unreservedly apologise for these statements and make clear to our readers:

- The ABC system is the sole authoritative measure of copy sales used by publishers in this country.
- Future Publishing have always published their ABC figures in leading trade papers.
- We acknowledge that Amiga Power is the UK's biggest selling Amiga games magazine as measured by the ABC.

We again would like to apologise to Future Publishing and the ABC for the article in question and regret any inconvenience that this may have caused.



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Sega Mega Drive 16Bit

	R.R.P	Our PRICE
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Sega Mega Drive 16Bit

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THE DUNGEON

Welcome to our monthly look at the CPC adventure scene. This is where you'll get all the news of the latest releases, help with your queries and generally discussions on anything relevant

NEWS

ADVENTURE PROBE is now six years old. Known affectionately as Probe by all its readers, it is now the longest running monthly independent adventure magazine of all. Although multi-format in its coverage of the adventure scene, it does include a fair proportion of news applicable to the CPC but its success is mainly due to its extremely friendly atmosphere and new readers are always made to feel welcome and are encouraged to contribute. £1.50 will get you approximately 48 pages and further details can be obtained from the editor Mandy Rodrigues, at 67 Lloyd Street, Llandudno, Gwynedd, LL30 2YP.

REVIEWS

THE COLLECTION

Vol.5: The Guild. Disc £5. On this disc are five adventures all written by Jack Lockerby & Roger Betts and originally released by River Software for the Spectrum only. Now Tony Collins of The Guild has had them converted to run on the Amstrad but they will only work under CP/M. The five titles are:

INTO THE MYSTIC,
THE MISER,
DAVY JONES LOCKER,
TREASURE ISLAND
THE BOUNTY HUNTER.

INTO THE MYSTIC

The countryside was in uproar. Folk congregated and spoke in hushed tones. 'Where has all the magic gone?' they asked each other. 'Without magic our lives are empty and void.' And indeed they were, as there was no telly in those far off days. After a hard day in the field what better way to unwind than to sit with a jug of ale watching old Merlin conjure new and mysterious tricks?

So the Privy Council hold a meeting as they usually do when they don't know what to do next. After a lot of passing the buck Merlin is chosen, no, not to go on the quest but chosen to find some mug daft enough to put his life on the line. Guess who that mug is going to be?

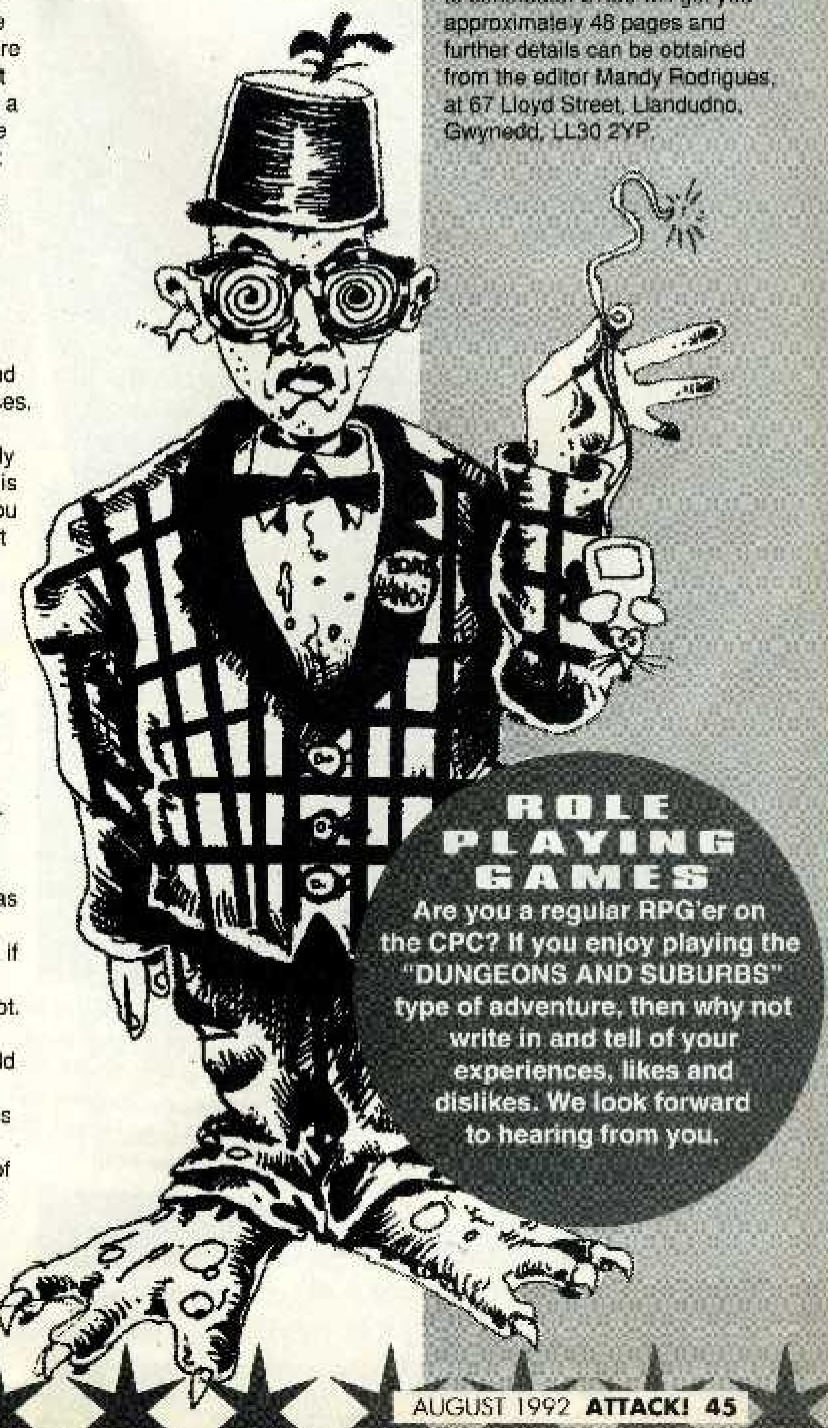
Having been chosen by Merlin you then learn that all you have to do is to go on a quest and discover why all the magic produced is disappearing into the earth, armed with only the smock and the sandals you are wearing. As the first thing that you bump into happens to be a band of robbing Orcs, you are going to have your wits about you as well.

Even after passing the Orcs you quickly discover that the area is infested with outlaws and trying to avoid these are just one of the many puzzles ahead. An important clue to remember is that Examine and Search give different responses. Also remember to Ramsave often as you will most certainly need to do so. However, this is one of those games where you do not mind getting killed as it keeps you interested all the way through.

DAVY JONES LOCKER

"On August 11th 1927 the clipper Allana was lost at sea with only five people surviving. Davy Jones Locker lets you relive the final days these five survivors endured, and reveals the secret that has baffled Mankind ever since."

That is the opening text and if you feel that the story-line sounds a bit grim then fear not. This is in fact a light-hearted romp full of awful puns and old jokes and makes a welcome change in an often too serious world. There is a comprehensive help screen of coded hints for when you get stuck and several humorous comments that will appear and bring a smile to your face. Have fun.



ROLE PLAYING GAMES

Are you a regular RPG'er on the CPC? If you enjoy playing the "DUNGEONS AND SUBURBS" type of adventure, then why not write in and tell of your experiences, likes and dislikes. We look forward to hearing from you.

THE DUNGEON

THE SCROLL OF WISDOM

The following good person, who is an experienced adventure player, has kindly offered to help any readers who are having difficulty with a particular problem. Please do not ask for full solutions and treat the "Scroller" with due respect. Either telephone ONLY during the times shown or include a stamped S.A.E if you write to her:

Joan Pancott, 78 Radipole Lane, Weymouth, Dorset. DT4 9RS. Tel: 0305 784155 - Any day - ONLY between 1pm and 10pm.

(I think my fingers will be worn out by the end of typing this little lot!) Acheton, Adventure Quest, Adventures of Zebedee Gonig, Aftershock, Angelicus Saga, Angelique, Apache Gold, Arnold Goes Somewhere Else, Atalan, Avon, Ballyhoo, Base, Bestiary, Black Knight, Boggit, Bored of the Rings, Brawn Free, Case of the mixed-up Shymer, Castle Blackstar, Castle of Skull Lord, City for Ransom, Classic Adventure, Colossal Adventure, Colour of Magic, Countdown to Doom, Crispin Crunchy, Crystal Theft, Cursed be the City, Dodgy Geezers, Dracula, Dungeon Adventure, D.A.A, Emerald Isle, Enchanter, Erik the Viking, Escape from Koshima, Escape from Prison Planet, Espionage Island, Fantasia Diamond, Flook, Forest at Worlds End, Fourth Protocol, Giant Killer, Gnome Ranger, Gremlins, Grue-Knapped!, Guild of Thieves, Heavy on the Magick, Helvera - Mistress of the Park, Heroes of Karn, Hitchhikers Guide, Hobbit, Hollywood Hi-jinx, Hunchback, Imagination, Inca Curse, Infidel, Ingrids Back, Island, Jewels of Babylon, Jinxter, Kentilla, Kingdom of Hamil, Knight Orc, Kobyashi Naru, Lancelot, Leather Goddesses, Lords of Time, Lost Phirious 1,2&3, Magicians Apprentice, Message from Andromeda, Mindfighter, Mindshadow, Monsters of Murdac, Mordons Quest, Mountains of Ket, Mystery of Indus Valley, Necris Dome, Never Ending Story, Not a Penny More, Nova, Orb Quest, Panic beneath the Sea, The Pawn, Philosopher's Quest, Planet of Death, Price of Magik, Prison Blues, Project Annihilation, Project Volcano, Qor, Quest for the Golden Egg-cup, Questprobe 3, Red Moon, Return to Doom, Return to Eden, Rigels Revenge, Robocide, Scary Tales, Scapeghost, Seabase Delta, Seas of Blood, Simply Magic, Smashed, Smirking Horror, Smuggler's Cove, Snowball, Spiro Legacy, Sorcerer, Souls of Darkon, Spellbreaker, Spytrek, Star Wreck, Subsunk, Sydney Affair, Talisman of Power, Terrormolinos, Test, Time, Top Secret, Total Reality Delusion, Trial of Arnold Blackwood, Vera Cruz, Very Big Cave Adventure, Village of Lost Souls, Warlord, Wise and Fool of Arnold Blackwood, Worm in Paradise, Yarkon Blues & Zork 1.

If you're going to write for help, please do not just say "I'm stuck in XYZ adventure, can you give me some tips?" Some of these adventures are huge so please try to be specific about where and why you are stuck, in order to be helped.

"MY LAMP WON'T WORK" DEPARTMENT

Ryan Elsender has written with some clues for CASTLE MASTER and also is seeking some help so he can complete the final section. First the clues as to where to find certain keys!

Key for Dragon's Lair = fall down hole in chapel floor
Key for Wizard's Hut = in well
Key for Stairwell = in lobby
Key for Guard Room = fall down well
Key for Junk Room = on roof of church
(Stand on drawbridge, shoot the green square. This will close the drawbridge and send you flying through the air and you will land on the roof.)

Now to Ryan's problems;
Where is the key that opens the Kings Solar?
Where is the key that opens the Spirits Abode?
Where is the key that opens the High Ledge?
Where is the key that opens the Stable?
How do you kill the dragon at the top of the Stairwell?

There you go folks, all answers gratefully received here at The Dungeon so we can put Ryan out of his misery.

REVIEW

THE MISER

Based upon the Charles Dickens character of Ebeneezer Scrooge from "A Christmas Carol", this adventure loosely follows the same story-line of a miserly money lender, who has to redeem himself by doing twelve good deeds in order to be invited to spend Christmas with his long-suffering nephew Fred.

The adventure allows you to travel in all the normal directions plus you can also go BACK and FORWARD at certain locations. These movements relate to time and mean that you can travel back in your past or forward to the future. This will be essential in order to collect certain items to be able to carry out some of the deeds. Everything is explained in the text if you study it carefully and you should not have any trouble figuring out what you need to do. Not a large game but it will need careful mapping as there is a lot of to-ing and fro-ing.

This is as far as I've got with this disc which, as you can see, is crammed full with some good quality adventures. As they work out at only one pound each they are super value and I can thoroughly recommend this collection to you. Available only by mail order from The Guild, 760 Tyburn Road, Erdington, Birmingham, B24 9NX.

Please send all correspondence, hints, maps, complaints, etc. to: THE DUNGEON, CPC ATTACK!, HHL Publishing, Greater London House, Hampstead Road, London NW1 7QQ.

NEWS

Firstly, and sadly, we have heard of the demise of Penguin PD. If anyone wanted the Utilities 3 program, reviewed in June, it can be purchased from most other libraries.

An interesting letter has arrived from Obi Okwudili. Obi runs a new PD library going by the name of MERLINS PD SOFTWARE. What makes Merlins a bit different from the rest is that they specialise in demos. Now I'm not talking about the first level of the latest shoot'em up game when I mention the word "Demo". The type of demo that we are discussing here is a piece of coding done by machine code wizards who manage to to turn the screen of your humble Arnold into a mass of colourful scrolling text, multi-coloured sprites going in all directions, some pretty funky music and oh yes, it's all happening at the same time. Impressed? You'll be even more so when you see it for yourself as mere words and screen shots can hardly capture the spectacle in store for you. There is a review of some of his goods further on in the Review section.

Obi's letter also informed me that he is a graphic artist and he has set up his own demo making team. They are only small and they are looking for some more people to join them. If you are a coder and would like to become part of the team, then Obi would love to hear from you.

Finally, as part of Merlins PD commitment to their customers, Obi also tells me that he offers an on-line technical help service and that all discs will be dispatched next day in your stamped self-addressed envelope. Sounds good to me.





PUBLI SECT

The only monthly round-up of the PD news and reviews worth reading

REVIEWS

MERLINS PD. Cost: 50 pence per side plus disc and SAE.

Merlin have sent me a sample disc which included the following demos: AMSTUS8, ESCAPE3, SPACEGLIDER, TWINBLAST & GOS.

How do you describe a demo in words? Well you can't really, you just have to watch it and as you do, you can try and figure out how on earth it has been programmed to do all the different things that it is doing. In my case, I fail miserably. Still, this does not prevent me enjoying them.

Unfortunately the disc does not carry any sort of information about the crews who have put these demos together but some of the on-screen text is in German. This, however, does not detract from the overall effect and all the demos ran by just typing the filename. The occasional hitting of the spacebar moves you into the next section.

Your screen then bursts into life with so much happening at once and with so many different colours that you didn't know you had, that you begin to wonder if you're still looking at a CPC. Truly amazing!

A word of warning, though, to anybody who may be offended by bad language! There is some included in the scrolly text. Now I don't understand why these programmers who are obviously very clever, feel the need to denigrate their audience by resorting to constant use of the "f" word but they do, so it is only fair that I warn you. Otherwise, a collection of some of the very finest coding that demonstrates just what a versatile machine the CPC really is and what can be achieved by some very talented coders.

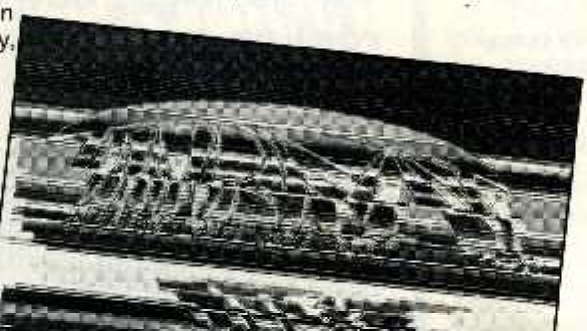
I hope that once Obi and his English team have produced their first demo, that they will send it to me for a review. It would be nice to see that we can program as well as, or better than, our continental cousins. Good luck lads.

NSWP (Various PD libraries)

Are you looking for a good public domain utility that will

take care of all the housekeeping that you often need to perform on your discs? Although new ones are being released all the time they always seem to do only part of the job and never cover everything. There is, however, one that has been around for a number of years and has in my opinion never been bettered. It is called NSWP (also sometimes called NSWEEP.)

NSWP is a utility. Now, that bare statement doesn't even begin to describe its many features so let me fill in a little more of the detail for you. It is a Directory and File Manipulation Program. With it, you can copy, delete, rename, unsqueeze and squeeze files, either individually or en masse. It comes complete with full documentation which is split



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into two major sections: a tutorial for the inexperienced, and a comprehensive reference section. Unlike many CP/M program documents, these are very well written and easy to understand. Having said that, it was in fact a long time before I ever got around to reading the documents, because NSWP has a very good front end and is most intuitive to use. A single keypress menu, lists all the major features and you will probably find yourself using the program as soon as it has loaded. The menu looks like this:

NSWEEP - Version 2.07 07/17/1984
(c) Dave Rand, 1983,1984 Edmonton, Alberta

A - Retag files	I Q - Squeeze/Unsqueeze tagged files
B - Back one file	I R - Rename files
C - Copy file	I S - Check remaining space
D - Delete file	I T - Tag file for mass
E - Erase T/U files	I U - Untag file
F - Find file	I V - View file
L - Log new disc/user	I W - Wildcard tag of files
M - Mass file copy	I Y - Set file status.
P - Print file	I ? - Display this help
X - Exit to CP/M	I cr, sp - Forward one file

Drive A0: 50K in 14 files. 128K free.

```
1. A0: CPCTENT  .BAS  10K <SP>
2. A0: CPCART   .COM  4K <SP>
3. A0: CPCPICT  .BIN  2K <SP>
4. A0: CPCDOC   .COM  2K <SP>
5. A0: CPCBILL  .BAS  2K <SP>
(Etc.)
```

Once the menu has loaded, you are also presented with a report of which drive and user you are logged to, how much space is taken by the files you have specified, how many files have been found with the specifications given, and how much space is left on the disc. As you can see from above, this program can cope with just about every type of disc management operation that you will ever need but it also has one very important option not normally included on disc/file copiers, even commercial ones. This is the ability to "Unsqueeze" files.

If you have ever obtained an item of software from a PD library, especially if it was down-loaded from a bulletin board, you may well have found that certain files had an odd extension, such as "DQC" instead of the more normal "DOC". If the middle letter is a "Q" then this means that the file has been squeezed and it will need to be un-squeezed before you can use it. With NSWP this couldn't be easier. Have a blank disc ready to receive the new unsqueezed file (it will be a lot larger than the squeezed version) and then press "Q" to tag the original file. After a few prompts, NSWP will dump the unsqueezed file to your new disc. Readers with two drives will find this an absolute doddle.

I mentioned earlier the full documents but I will be surprised if you need to refer to them very often. Just pressing "?" at any time brings up a very useful "Help" screen. This program really does destroy the myth that anything to do with CP/M is not "user-friendly". I like and use this program so much that I have had it blown onto a ROM so that it is immediately available, along with my CP/M roms from Graduate Software. Most good libraries should be able to provide you with this program on disc. Shop around from our regular list of libraries for the best price and availability and learn to love your CP/M A> prompt.

LIBRARIES

As usual, we finish off with a list of the libraries who have contacted me and sent in examples of their programs and / or a catalogue. If you are a Public Domain library or you wish to recommend one or even a particular program, then I'd be delighted to hear from you.

Write to:
PUBLIC SECTOR,
CPC ATTACK!,
HHL Publishing,
Greater London House,
Hampstead Road,
London NW1 7QQ.

3D PD Library. 44 Echline Grove, South Queensferry, West Lothian EH30 9RU.
ADVENTURE PD. 10 Overton Road, Abbey Wood, London SE2 9SD.
AMSTER'S CAGE DATA PD. Lightcliffe, Station Hill, Wigton, Cumbria CA7 9BW.
DARTSMA PD Library. 47 Kidd Place, Charlton, London SE7 8HF.
DEMON PD Library. 47 Hilton Avenue, Hall Green, Birmingham B28 0PE.
EGERTON PD Library. (Tape) 7 Linden Close, Stafford, Staffs ST17 9TH.
MERLINS PD SOFTWARE. 79 Otter Street, Derby DE1 3FD.
POWER HOUSE PD. 5 Pentland Road, Slough, Berks SL2 1TL.
ROBOT PD Library. 2 Trent Road, Oakham, Rutland LE15 6HF.
SCROLL PD. 14 Linacre Cres, Cirencester, Glos GL7 1WB.
SOUNDS LIKE PD. 6 Keyberry Park, Decoy, Newton Abbot, South Devon TQ12 1BZ.
YORKIE PD 11 Beechwood Avenue, St. Albans, Herts AL1 4XP.
WACCI PD Library. 16 Ayling Lane, Aldershot, Hants GU11 3LZ.

The above librarians will be happy to send you a stock list but PLEASE include a stamped self-addressed envelope. For those of you with a Modem, you can try down-loading some FREE Public Domain programs from the CPC/CPM file areas on the following bulletin boards:

RED ROSE
0772 652212 (24 hours) Scrolling

SILICON VILLAGE
081 759 2348 or 0734 819000 (24 hours) Viewdata

CONTACTS

SCR DEM

We get right down to writing real up and down, left and right, scrolly scrollies

"But we've already done scrollies!" Not like this one, we haven't. The scrolly we used in issue 1 was a simple, right-to-left one. This one is altogether more spectacular: it can go across in a "sine wave" shape, diagonally, or any way you want it to...

Much of the groundwork for programming a scrolly (such as the code to take a character from the text and print it) we covered in issue 1, and that's useful again here. The new bit is the special scroll routine, which amazingly for such an impressive effect, is only a few lines of code long.

The theory (yawn) is as follows. We put a table in memory with the screen addresses which describe the path of the scrolly in. The first byte of the table will be the leftmost address of the top pixel line of the scroll, followed by the next one along, and so on. This will be repeated for all eight pixel lines.

So all we need to do, to scroll in this pattern, is take each screen address from the table, and the address where the byte from this is to be put (which will be different, of course, depending on what shape the scroll is to be). We can then copy the byte from one address to another, and repeat for all the screen addresses in the table, which will cover the whole scroll. All very well, until you actually try programming the thing: the CPC, with its humble 8-bit processor, can't do that much, plus the other effects you will no doubt want in your demo, in one frame flyback.

The answer? Write a faster routine. (They don't call me Mr. State-The-Obvious for nothing!) The trick with speeding up any machine code routine is to examine each part, and see where that can be speeded up. There is one fairly obvious bit in our above "algorithm": if going from left to right, the screen address to copy TO will always be the one copied FROM last time! (If that doesn't click, try drawing a diagram on a piece of paper. It should make it clearer.) Therefore we can save time by, instead of getting a new value from the table, just putting the address copied from last time into the address to copy to.

The other thing we can do is speed-up the table accessing routine. Although you might not realise it, the Z80 has built in routines for ploughing through a table, taking values out one-by-one. This is exactly how the stack works - so if we set the stack pointer (SP register) to the start of

THE CODE

```
         org &8000          ;The code starts at &8000

flloop:  call &BD19         ;Synchronise to frame flyback
                            call scroll         ;and do the scroll!

         ld a,(toggle)      ;Recognise this from Issue 1?
         xor 1              ;It prevents the text print code
         ld (toggle),a      ;from being run every other
         jr z,flloop        ;time.

         ;This part gets and prints a character from the message

         ld hl,(pointer)    ;Get the pointer to within the message
         ld a,(hl)          ;and get the character from there
         or a               ;Is it zero (end of message)?
         jr nz,not0         ;If not, go and print it...
         ld hl,message      ;else reset the pointer to the start
         ld a,(hl)          ;and get a character from there
not0:    push hl
         push af            ;Preserve HL and AF from corruption
         ld hl,&280D
         call &BB75         ;LOCATE text at (40,13)
         pop af
         pop hl             ;Get HL and AF back again...
         call &BB5A         ;and print the character!
         inc hl             ;Increase the text pointer
         ld (pointer),hl    ;and store it.
         jr flloop          ;Finally, loop back to frame flyback

         ;The subroutine below is the scroll routine

scroll:  ld (spstore),sp    ;Store the current stack pointer
         di                 ;and turn interrupts off (vital)
         ld sp,&4000        ;Stack pointer to start of table
         ld c,8             ;Eight pixel lines to do!
outer:   ld b,&4F           ;and 79 bytes in each one
         pop de             ;First address to put a byte into
inner:   pop hl             ;Get the address to take it from
         ld a,(hl)          ;Take the byte...
         ld (de),a          ;and put it in the new location
         ex de,hl           ;Make the new address to put it in
                            ;(DE) the address just taken from (HL)
         djnz inner         ;and repeat this for all 79 bytes
         dec c              ;Decrease the pixel line count
         jr nz,outer        ;and repeat for eight pixel lines
         ld sp,(spstore)    ;Restore the original stack pointer
         ei                 ;Turn interrupts back on
         ret                ;and we've finished!

toggle:  defb 0             ;Character print toggle
pointer: defw message       ;Text pointer value
spstore: defw 0             ;Temporary storage for SP
message: defm "Watch out Europe, here we come!        ",0
```

TEACH YOURSELF DEMO-SPEAK

Like most areas of computing, demo-writing has its own "jargon". Here's the inside info on scrolly terms.

HARDWARE SCROLL. A large scroll achieved by moving the start of screen memory, rather than physically shifting bytes left. Trickier to do but much faster than a software scroll.

SINUS SCROLL. A scroll in the shape of a sine-wave (a sort of wobbly effect). And you thought a sinus was something up your nose...

BIT SCROLL. Pixel-perfect scrolling, usually in MODE 2: in MODE 2, one pixel takes up one bit, hence the name.

RASTER SCROLL. In this the scroll isn't actually written into screen memory, but is projected by changing the inks on the screen as the electron beam passes the right places to form the shape of the letters. Very tricky to do, but produces smart parallax effects.

PARALLAX. Two or more things moving at different speeds. One of the most impressive effects I have ever seen in a demo was in the New Age demo 1, where a Shadow of the Beast-like landscape scrolled past, but it was all in black, so you couldn't see it! That is, except when the raster scroll passed over it, which "lit up" the landscape beneath it. The scroll was moving faster than the landscape, so the effect was like a moving "window" on the landscape.

MEGA-APOCALYPTIC GIGA SCROLL. Like the one described above, a scroll which is pretty good, really.

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our table, pretending that all the values in it have been PUSHed previously, then we can POP each one off easily and quickly. The only thing to note is that interrupts must be off: if an interrupt occurs in the scroll processing, it will start playing about with the stack, and mess up the table.

I've suggested two possible shapes for the scrolly: a "sinus scroll" and a diagonal scroll. It's up to you to experiment to find out more. One thing to note: the last two bytes on each row (i.e. text column 40) should correspond exactly to where you are printing the text (in our example, at line 13). If you change this, change where you print the text, and note that these two bytes must be level with one another - after all, that's how a character is printed.

The code, as usual, is in a box for you to type in and assemble. Save the code out as "SCROLL.BIN" (now there's an original name) - for example, using Maxam's WRITE command - and we can then load it into the BASIC program that will generate the screen address table. When you use this or similar in your own demos, you won't want the delay as the BASIC program calculates the addresses each time: so, once the table has been generated once, save it out as a binary file (length &500) and then load it into &4000 (or wherever) in future.

MACHINE CODE TUTORIAL

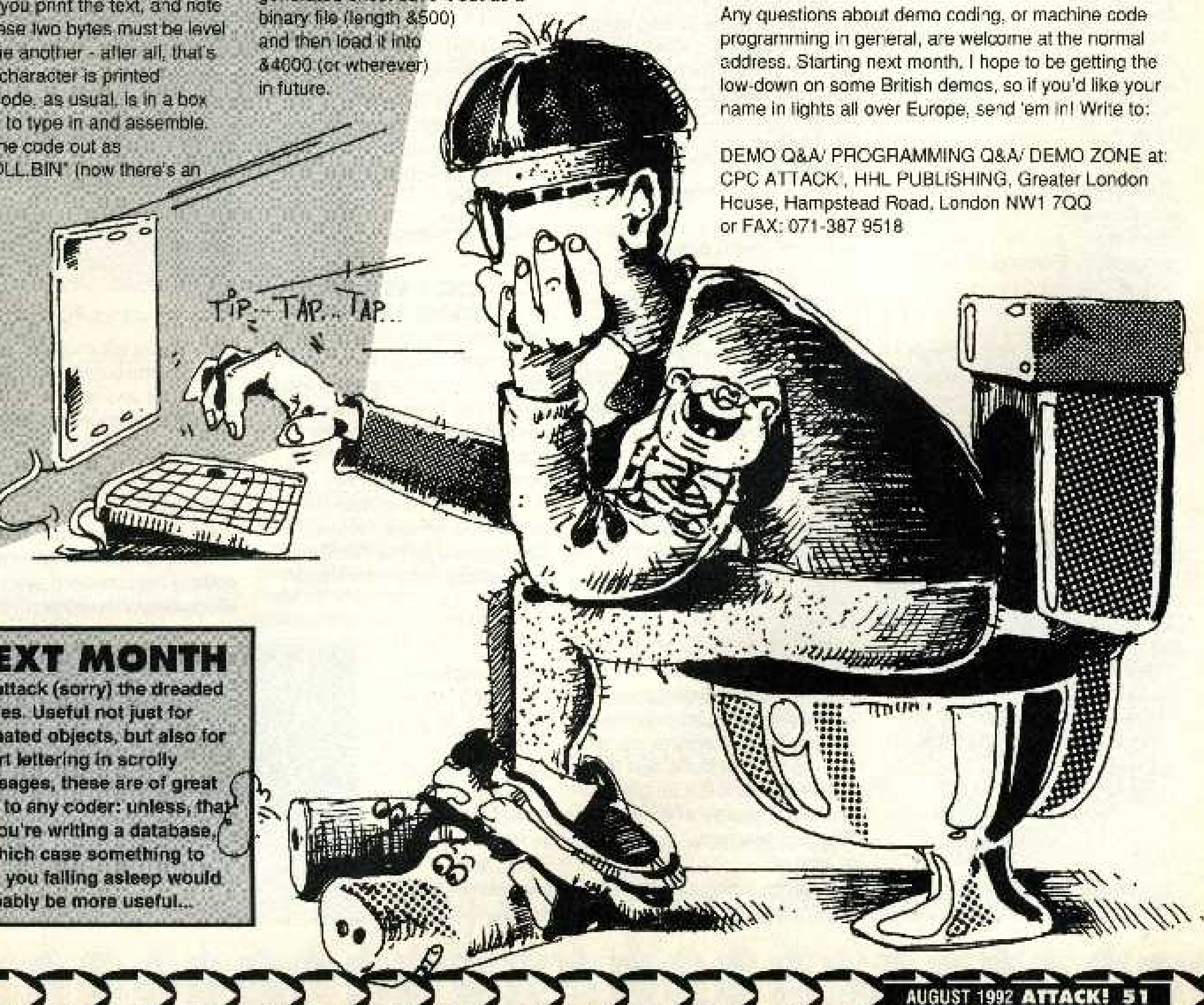
THE BASIC LOADER

```
100 DEF FNl(a)=49152+(a\8)*80+(a MOD 8)*&800
110 DEG: DEF FNb(x)=98+INT(SIN(MIN(x,78)*4.5)*10)
120 MEMORY &3FFF: LOAD "scroll.bin",&8000
130 MODE 1
140 a=&4000: FOR r=0 TO 7
150 FOR x=0 TO 79
160 p=FNl(FNb(x)+r)+x
170 POKE a,p-INT(p/256)*256
180 POKE a+1,INT(p/256)
190 POKE p,255
200 a=a+2: NEXT x,r
210 CALL &8000
```

Line 100 is the formula to convert line addresses to screen addresses.
Line 110 is the equation for the shape of the line. Experiment with this for different shapes: you might like to try DEF FNb(x)=57+x\2.
Line 120 loads in the machine code. Change the filename as needs be!
Line 160 gets the screen address of the current row and column.
Lines 170 and 180 poke this address into the table.
Line 190 plots it on the screen (so you can see what it will turn out like).
Finally, line 210 CALLs the machine code!

Any questions about demo coding, or machine code programming in general, are welcome at the normal address. Starting next month, I hope to be getting the low-down on some British demos, so if you'd like your name in lights all over Europe, send 'em in! Write to:

DEMO Q&A/ PROGRAMMING Q&A/ DEMO ZONE at: CPC ATTACK!, HHL PUBLISHING, Greater London House, Hampstead Road, London NW1 7QQ or FAX: 071-387 9518



NEXT MONTH

We attack (sorry) the dreaded sprites. Useful not just for animated objects, but also for smart lettering in scrolly messages, these are of great help to any coder: unless, that is, you're writing a database, in which case something to stop you falling asleep would probably be more useful...

Attack! TUTORIAL

ELEMENTARY BASIC

Part 3

Learn how to program a better colour display in this handy programming tutorial

Last month, we used the keyword PRINT to display information on the screen as the program below.

10 REM Display Information on the screen
20 CLS:REM Clear the Screen
30 PRINT "CPC Attack"
40 PRINT "is Too Hot to Handle"
50 PRINT "and Too Cool to Miss"
60 END

Type in this program, pressing the Enter/Return key at the end of each line and then "Run" the program by Entering "RUN" as below.

RUN

What you will see is an almost empty screen with the words

CPC Attack
is Too Hot to Handle
and Too Cool to Miss

Ready

We can improve the impact of this statement by changing the size of the characters, which we can do by using the keyword MODE. MODE sets the screen display to 20, 40 or 80 characters. Try the three Modes by entering the statements below. (Type in the statement and press the Return/Enter key)

MODE 0
RUN

MODE 1
RUN

MODE 2
RUN

The MODE 0 (20 Characters) is the best for this statement as the second and third lines fill the screen. So replace the CLS on line 20 with MODE 0 and run the program.

20 MODE 0:REM Clear the screen to 20 X 25

The first statement "CPC Attack" would look much better if it were displayed in the centre of the screen and we can achieve this in two simple ways. The length of the statement "CPC Attack" is 10 characters, the screen length 20 so if we add 5 spaces to the beginning of the statement within the inverted commas the statement will be central. We can add spaces in two ways: by pressing the spacebar 5 times or by using the keyword TAB as below.

30 PRINT " CPC Attack"

or

30 PRINT TAB(5);"CPC Attack"

Replace line 30 with one of the lines above and "Run" the program. Although the display is improved we can enhance it still further by adding colour.

COLOUR

You can change the colour of any information displayed on the screen by using the keyword PEN. You are restricted to a maximum number of colours in each MODE: 16 for Mode 0, 4 for Mode 1, and 2 for Mode 2 so the choice of mode is important if multi-coloured displays are required. Our display program is in Mode 0 and therefore we can have up to 16 colours. Add the following lines to the program for a coloured display when you "Run" the program.

25 PEN 3
35 PEN 10
45 PEN 6

Change the pens to other colours using a number from 1 to 15. Zero (0) can be used but this is the background colour and therefore you will not see the text.

BACKGROUND COLOUR

The colour of the display's background can be changed using the keyword PAPER again with 16 choices in Mode 0. Try.

25 PEN 3
35 PEN 10:PAPER 6
45 PEN 6:PAPER 0

You can also change the border of the screen by using the keyword BORDER but this time you have a choice of 27 colours 0 to 26. Try

15 BORDER 20

COLOUR CHOICES

Although you are restricted to the amount of colours you can display at any one time on the screen you have a choice of 27 colours available. You can change the colour of a certain pen or paper number by replacing the ink colour. The keyword to replace the ink is INK followed by the Pen/Paper number and then the ink colour. Try.

INK 3,19

This changes pen or paper 3 to the ink colour 19 which is Sea Green and if you had any text displayed on the screen with PEN 3 or PAPER 3 this would have changed from Red to Sea Green.

FLASHING

You can set up a pen/paper colour to flash between one colour and another using the INK statement as below.

INK 3,19,15

Flash Pen/Paper (3) between Sea Green (19) and Orange (15). You can also change the flash rate by the use of the keyword SPEED INK as below.

SPEED INK 200,50

The 200 means 200 times 0.02 seconds = 4 seconds that the sea green will be displayed and 50 X 0.02 = 1 Second that orange will be displayed. You can also flash the border between inks by using

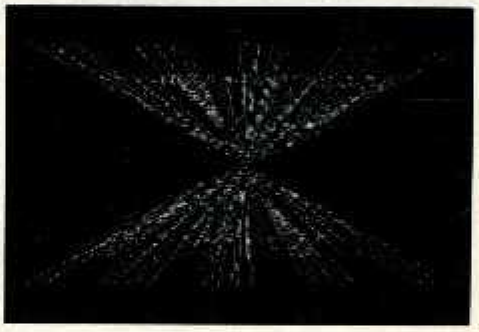
BORDER 7,10

Flash the border Purple to Cyan

By now you will probably have changed the colours of the Pens and Paper and have all sorts of flashing colours so to re-set the colours back to normal without losing the program Enter

CALL &BC02

CALL &BC02 tells the computer to use a small piece of machine code in the operating system which resets the screen



management system. The strange number &BC02 is the address of the routine in hexadecimal numbers. I will deal with CALL and Hexadecimal at a later date, it is a way to mix Basic and Machine Code.

DISPLAYING INFORMATION AT SPECIFIC SCREEN POSITIONS

The use of colour can improve your screen, display but probably one of the most important keywords which can be used to display information is LOCATE. Locate allows you to place information anywhere on the screen, the full command being LOCATE x,y. The x variable is the amount of characters from the left hand-side of the screen and y is the amount of characters down the screen. Enter the following

```
NEW
10 REM Locate
20 MODE 0 30 LOCATE
5,12:REM 5 characters across
```



```
12 lines down
40 PRINT "CPC Attack!"
50 END
```

The keyword NEW was used to ensure the memory was empty before starting a new program, this avoids any problem with lines left from the previous program.

When using the keyword Print each successive statement is displayed on a new line, when the bottom of the screen is reached the whole screen scrolls upward one line removing information. With most programs this would not be satisfactory and therefore each print statement would be located on the screen in predefined positions. The next two programs use a loop to demonstrate.

```
NEW
10 REM Scroll
upwards
20 FOR
number=1 TO
100
30 PRINT
number
40 NEXT
number
50 END
```

Run the program to see the screen scroll. Now add line 25 to program to locate the number printing at 9 across by 13 down.

```
25 LOCATE 9,13:REM Move to
9 from the left 13 down
```

In this program the lines between 20 and 40 are repeated 100 times printing 1 to 100 - watch out for an explanation of loops next month. The first program scrolls the screen because the print statements reach the bottom of the screen whereas the program with line 25 holds the print display at position 9 by 13.

Finally this month, information is taken from the keyboard from the keyword INPUT. Most programs will need to ask for information to be typed in at the keyboard and INPUT is provided for that purpose. When you use INPUT you must tell the computer where to store the information by stating a variable name after the Input keyword. Enter.

```
INPUT name$
```

A question mark is placed on the screen, it is waiting for information to be typed in and then the Enter/Return key pressed. Type in your name and press Enter/Return. The information you have typed in is now stored in memory which is labelled (name$). To find out what you typed in enter.

```
PRINT name$
```

When using Input you can also place a prompt string after the keyword and before the variable, this prompt string should tell the person who you expect to enter information, what you require, as below.

```
NEW
10 REM Ask for the persons
name
20 MODE 1
30 LOCATE 1,10:REM Start 1 in
10 down
40 PEN 2
50 INPUT "Please enter your
family name";surname$
60 PEN 1
70 LOCATE 1,18:REM Reply 1
in 18 down
90 PRINT "Very Posh the
";surname$;" family"
100 END
```

Next month, we'll be looking at programming loops and further use of the keywords discussed this month. In the meantime here is a program that displays all the INK colours so you can choose the colours which suit you best. You can only display 16 colours at once on the screen so the program displays the inks 1 to 10 then 11 to 20 and finally the remaining 21 to 27. Study this program to see how much of the code you understand, which are variables and keywords and note that lines 40,50 and 60 are the same except for the start and finish variables, these are the three screen displays.

```
10 REM Ink Colours

20 INK 0,0:BORDER 0:REM Set
background to black

30 MODE 0:REM 20x25 with 16
colours

40 start=1:finish=10:GOSUB
90:GOSUB 110:GOSUB 200

50 start=11:finish=20:GOSUB
90:GOSUB 110:GOSUB 200

60 start=21:finish=27:GOSUB
90:GOSUB 110:GOSUB 200

70 CALL &BC02:PAPER 0:PEN
1:REM Reet the colours

80 MODE 1:END

85 REM ***** Change the inks in
the pens *****

90 lastpn=(finish-start)+1:FOR
n=1
TO lastpn:INK n,start+n-
1:NEXT:REM Change all pens
to the inks from start to finish

100 RETURN

105 REM **** Display the
colours *****

110 background=0:PEN
1:PRINT TAB(5);"INK
COLOURS":PRINT

120 FOR colour=start TO finish

130 PEN 0

140 background=background
+1:PAPER background:REM 1
2 3 4 etc

150 colour$=STR$(colour):REM
Make number into a string.

160 display$="INK COLOUR"
+colour$:display$=display$+
STRING$(20-LEN(display$),32):
REM Build display$ to be INK
COLOUR followed by the
number and then spaces to the
end of the line.

170 PRINT:PRINT display$;

180 NEXT

190 RETURN

200 REM **** Pause until a key
is pressed *****

210 LOCATE 4,25:PEN
1:PAPER 0:PRINT "Press any
key"

220 k$="":WHILE
k$="":k$=INKEY$:WEND

230 PAPER 0:CLS:REM Black
Screen

240 RETURN
```

KEYWORDS USED THIS MONTH

PRINT Display information to the screen
MODE Definition of the screen, characters across 20,40 or 80
TAB Print a certain amount of spaces
PEN Colour of the text
PAPER Colour of the background
INK Colour used for the Pen or Paper
SPEED INK Flash rate of two colours assigned to one pen
BORDER Colour of the edge of the screen
LOCATE Place information at a specified position on screen

Oh dear, what have you missed?
PART 1 BASIC KEYWORDS June 1992
PART 2 THE SCREEN DISPLAY July 1992

NEXT MONTH PROGRAMMING LOOPS & KEYWORDS

A SMALL SELECTION FROM OUR WAREHOUSE

CF2

3" DISCS	
BOX OF 10	£15.95 + £1.18 p&p
BOX OF 10 IN PLASTIC CASES	£21.95 + £2.36 p&p
EX – SOFTWARE HOUSE DISCS	£9.95 + £1.18 p&p

64K Ram Expansion, CPC464 only	39.84	3.53
3.50" DS/DD ADDXTRA, BRANDED & BOXED 10	5.99	1.18
CPC CENTRONICS PRINTER LEAD. 1.5m	7.64	0.59
CPC CENTRONICS PRINTER LEAD. 2.0m	8.40	0.59
CPC TO VIDEO LEAD, STATE BNC OR PHONO PLUG	7.14	0.59
EXPANSION PORT ADAPTOR FOR CPC 464/6128 PLUS MACHINES (WIDGIT)	9.40	1.18
ADVANCED ART STUDIO CPC DISK (REQUIRES 128k MEMORY)	16.41	1.18
GENIUS MOUSE + ADVANCED ART STUDIO	40.86	3.53
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ADVANCED BASIC

Attack! TUTORIAL

Part 3

Let's take a look at text windows and menus

The task this month is to produce a menu system for disc or tape, following the Program Development Stages discussed last month.

1 INITIAL PROGRAM IDEA

This of course is a menu system for the CPC. Once you have the idea you need to consider if it is worth continuing and answer some questions as below.

Can it be computerised?	Yes
Will there be a need for it?	Yes
Is it worth writing?	Yes

Once you have considered questions like this and determined that the program is viable you can move on to the next stage.

2 DESIGNING THE PROGRAM

For the menu I decided to use a highlight bar which moves up and down the program descriptions. The arrow keys will be used for selection. The menu needs to describe the programs in detail and therefore a flexible description width is necessary and the menu's descriptions should be easy to change.

I considered creating a file of the descriptions which would be loaded on "Running" the menu. This would be fine for a disc based system but not so clever for the tape system and in the end decided to place the program descriptions in data statements within the program.

A menu system is ideal for a disc based system but how could I make the menu system useful for the tape system. If the menu selected a program at the end of the tape it could take a long time before it started to load the file required. The answer was simple but took some time to think of, the program description could have the tape counter number for the program's position after the description of the program as below.

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This idea for the tape system allows you to use long tapes which are more readily available and makes the menu system useful for all.

Algorithm Of The Program

These are the logical steps which you will need to take to write the program and a guide to programming.

1. Ensure the Keyboard and colours are standard.
2. Read the data and display the window with descriptions.
3. Display the highlight bar and enter loop for arrow keys.
4. Run the program selected.

This is a shortened version but gives a clear outline of the intended program.

Experiment

Looking at the algorithm, one or two area's would probably be attempted first when developing this program. This would of course depend upon your experience. I have chosen the window with descriptions.

Text Windows

The length and amount of descriptions can change and therefore the window must be flexible. The descriptions will be read from data statements together with a title, the amount of descriptions will need to be read in before the descriptions so a For/Next loop can be used for the amount of data. The descriptions will use the array (menu$()) the amount of data and the vertical height (vh)

```
590 REM *** Text Window ****
600 REM ********************
610 REM hw=horizontal width vh=vertical height of window
620 x=((40-hw)/2)+1:y=(25-vh)/2:REM Find position of top left corner
630 WINDOW #2,x-1,x+hw,y,y+vh+1
640 PAPER #2,3:CLS #2
650 PEN #2,2:LOCATE #2,1+(hw-LEN(title$))/2,1:PRINT #2,title$
660 WINDOW #1,x,x+hw-1,y+1,y+vh
670 PAPER #1,2:CLS #1
680 RETURN
```

This window routine as it stands displays on the screen a window with a border and a title and can be tested using the set up lines below.

```
10 MODE 1:title$="Window Testing"
20 hw=26:vh=12:GOSUB 600:END
```

The next part of the program is the description display in window #1. The window is set at a size which is the length of the largest description with the height being set to the amount of descriptions, therefore a simple For/Next can be used to display the array as below.

```
240 REM Display descriptions
250 REM *******************
260 PEN #1,0:FOR sub=1 TO vh
270 LOCATE #1,1,sub:PRINT #1,menu$(sub);
280 NEXT sub
290 REM ********************
```

To test this next part of the program we need to set up the menu$ array and adjust the set up lines as below.

```
10 MODE 1:title$="Window Testing"
15 DIM menu$(21)
20 hw=26:vh=5:GOSUB 600
30 menu$(1)="Menu test 1":menu$(2)="Menu test 2"
40 menu$(3)="Menu test 3":menu$(4)="Menu test 4"
50 menu$(5)="Menu test 5"
300 END
```

By writing your code in a modular form you can save the individual sub-routines for use in other programs. We now have a text window in which we can display a quantity of information provided we set up vh (Vertical height, amount of descriptions), hw (Maximum Horizontal Width of the strings) and the array menu$().

3 CODING

The coding is the writing of the program.

The program starts by ensuring the computer is set correctly, CALL &BB00 resets the keyboard and CALL &BC02 resets the colours.

Lines 40 and 50 are lines drawn through the centre of the screen for effect. The program then reads the Data for title$, vh, menu$() and program$() checking at line 160 for the longest string hw (Horizontal Width).

Once the arrays have been set all of the menu$() are set to the same length (hw) using equal spaces at the beginning and end to centralise the description. (Lines 190-210 and Sub-routine 410 -450.)

Line 220 Calls the window

display at line 590.

Lines 260-280 Display the descriptions in the window.

Line 320 sets y to 1 this is used for the position of the highlight and then displays the highlight in reversed colours, sub-routine 470-510.

Lines 330 -370 are the main loop of the the program which checks for the up and down arrow keys and the Enter key.

Line 340 Checks if y is less than vh and if the down arrow key is pressed. Note if the condition is met the highlight is removed by overprinting with the normal pen and paper colours (GOSUB 530), the y variable increased by 1 and then the highlight replaced in the new position (GOSUB 470).

Line 360 Checks for the Enter key or Return key and, if pressed, sets flag to 1 leaving the loop.

Line 380 Runs the program asked for (y is set to the position of the highlight which is the number of the program array.

Line 390 This line is unnecessary as it will never reach here but this is the end of the program.

4 COMPILING THE CODE

This only involves typing "Run" when you have completed the listing as the CPC Basic is an Interpreter. Provided you have line 10 correct there is little chance of this program crashing but you should always save the program before you run it.

5 TESTING and DE-BUGGING

Once I had corrected the odd syntax error, I tested the program by placing the disc with some of these programs on it and ran the menu, selected the item and checked if the program selected ran. I also selected a program off the menu which I knew was not on the disc to see the result, the program ends and you need to "Run" the program again.

6 DOCUMENTATION

The menu is easy to use and convert for your own discs or tapes. The Data lines 730 onward are where you type the descriptions of the programs and the program names. If you are setting up a menu for a disc or tape first discover what it contains by using CAT. For the tape , zero the tape counter, CATalogue the tape and jot down the tape counter numbers for the start of each program. Now delete the lines 730 onward.

Your first line should now be at 730 which is the title of this particular menu.

730 DATA "The Menu Title"

The next data statement is the number of programs which you have on disc or tape with a maximum of 21.

740 DATA 18:REM 18 programs

After which are the data statements for the descriptions and program names, it is probably best to use a separate data line for each description and program name. This would mean for the example here you would need 18 data lines. Each data line contains two strings, the first string is the description of the program with a maximum length of 38 characters and the second string the program's name.

750 DATA "The Program Description String","filename"

As in the program example the tape menu could have the programs in order with the tape counter position for each program.

Sub-routines Or Applications

You may wish to use the menu to Load files of the disc or tape so you can continue developing them, i.e., files that are not complete or will not run at present to do this change the line 380 to Load.

380 LOAD program$(y)

7 MAINTENANCE

A small program like this will probably need little maintenance other than a new design although you could use a file instead of the data statements and write a program to create the file. As discussed earlier this I believe would only be suitable for disc based systems, but could restrict the length of descriptions and number to below the limits without chopping off information.

THE COMPLETE LISTING

```
5 REM MENU
10 CALL &BB00:CALL &BC02:REM Reset keyboard and colours
15 DIM menu$(22), program $(21): REM Maximum of 21 descriptions
20 MODE 1:PAPER 1:BORDER 0:CLS
30 maxstring=38: maxprog =21:REM Maximum length of string and maximum number
of programs
35 REM Screen Display
40 FOR n=0 TO 400 STEP 10:MOVE 0,n:DRAW 640,400-n,3:NEXT
50 FOR n=12 TO 628 STEP 12:MOVE n,400:DRAW 640-n,0:NEXT
70 REM ********************
80 REM **** Read Data *****
90 REM ********************
100 READ title$:REM Title for the top of the menu
110 READ vh:REM Reads the amount of lines which is also the vertical height of the
window
120 IF vh>maxprog THEN vh=maxprog:REM fix the maximum amount of programs
130 FOR sub=1 TO vh:REM sub for subscript
140 READ menu$(sub):READ program$(sub)
150 IF LEN (menu$(sub))> maxstring THEN menu$(sub)=
LEFT$(menu$(sub),maxstring):REM Ensure string size
160 IF LEN(menu$(sub))>hw THEN hw=LEN (menu$(sub)): REM Make hw equal to the
longest string
170 NEXT sub
180 REM develop strings with the information in the centre.
190 FOR sub=1 TO vh
200 IF LEN(menu$(sub))<hw THEN GOSUB 410:REM centre the description
210 NEXT sub
220 GOSUB 590:REM display window
230 REM ********************
240 REM Display descriptions
250 REM ********************
260 PEN #1,0:FOR sub=1 TO vh
270 LOCATE #1,1,sub:PRINT #1,menu$(sub);
280 NEXT sub
290 REM ********************
300 REM ** Menu selection **
310 REM ********************
320 y=1:GOSUB 470:REM display highlight
330 WHILE flag=0:REM Loop until flag=1
340 IF y<vh AND INKEY(2)=0 THEN GOSUB 530:y=y+1: GOSUB 470:REM Remove
highlight. Add 1 to y and print new highlight
350 IF y>1 AND INKEY(0)=0 THEN GOSUB 530:y=y-1:GOSUB 470
360 IF INKEY(18)=0 OR INKEY(6)=0 THEN flag=1
370 WEND:PAPER 0
380 RUN program$(y):REM Run the program selected
390 END
400 REM ********************
410 REM build string to equal the length of hw ********************
420 ftab=(hw-LEN(menu$(sub)))\2:REM Use integer divide for the front tab 430
menu$(sub)=SPACE$(ftab) +menu$(sub):REM add spaces to the front
440 menu$(sub)=menu$(sub)+ SPACE$(hw-LEN(menu$(sub))): REM add spaces to
the end
450 RETURN
460 REM ********************
470 REM ** print highlight *
480 REM ********************
490 PEN #1,2:PAPER #1,0
500 LOCATE #1,1,y:PRINT #1,menu$(y);
510 RETURN
520 REM ********************
530 REM * remove highlight *
540 REM ********************
550 PEN #1,0:PAPER #1,2
560 LOCATE #1,1,y:PRINT #1,menu$(y);
570 RETURN
580 REM ********************
590 REM *** Text Window ****
600 REM ********************
610 REM hw=horizontal width vh=vertical height of window 620 x=((40-hw)/2)+1:y=(25-
vh)/2:REM Find position of top left corner
630 WINDOW #2,x-1,x+hw,y,y+vh+1
640 PAPER #2,3:CLS #2
650 PEN #2,2:LOCATE #2,1+(hw-LEN(title$))/2,1: PRINT #2,title$
660 WINDOW #1,x,x+hw-1,y+1,y+vh
670 PAPER #1,2:CLS #1
680 RETURN
690 REM
700 REM ********************
710 REM Menu Data. Description followed by the name of the program
720 REM ********************
730 DATA "CPC Attack Tape Menu":REM Title of menu
740 DATA 8:REM Amount of lines on menu (Maximum 21)
750 DATA "Where is it! at 0","where":REM description followed by the file name.
760 DATA "Easydraw Two at 35","easydraw.2"
770 DATA "Connect Four at 110","confour"
780 DATA "Game Designer at 180","gamedes"
790 DATA "The Election Game at 246","elect"
800 DATA "Sound Keyboard at 300","synth"
810 DATA "Bounce at 370","bounce"
820 DATA "Adventure Maker at 465","admake"
```

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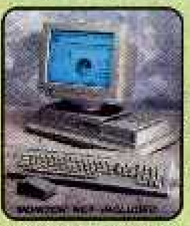
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TECHNIC

Q&A

**Need help? As we said before, most questions we get may appear to be easy-peasy, but we can deal with hard ones too! If you need any type of technical advice then get scribbling. The address is:
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HHL Publishing,
Floor 3,
Greater London House,
Hampstead Road,
London NW1 7QQ.
or FAX: 071-387-9518**

Remember peeps, don't call - we won't be in. And that's a fact!

Q

I own a CPC 464 and have recently sent away for a 6128 ROM chip, having become rather fed up of typing in a three page listing only to find FRAME, COPYCHR$, etc. in the middle of the program. I wish someone would warn me beforehand! Oh well, on with the problem. A 6128 owner cannot imagine a 464 owner's agony when he sees adverts for the latest serious software product, be it a sprite program or a word processor, and is about to send off his cheque when he sees in small print "Only Available on Disc"; or even an ad for a 3.5" disc drive with "464 must have DDI-1 first drive" in tiny lettering. I think I'm starting to waffle again. OK.

With the new chip installed I will have a 6128 O.S. Does this mean I can fool the computer into thinking that it already has a first disc drive and, through something like 'drive allocation', use an infinitely cheaper second drive instead. I hope this makes sense!

Bruce Gaston, N. Ireland

A

If only life were that simple, Bruce! I'm sure many other 464 owners out there will share your frustration at having to miss out on certain BASIC listings. The 6128's improved BASIC 1.1 does indeed incorporate several new features and commands but many of these can be quite easily implemented on existing 464s running BASIC 1.0.

For example, the FRAME and CLEAR INPUT commands can simply be replaced by CALL &BD19 and CALL &BB03 respectively. Similarly, GRAPHICS PEN n can have PLOT -10,-10,n substituted in its place. Admittedly commands such as COPYCHR$ and FILL require short machine code routines, but with a little ingenuity most programs can be made to run successfully on a 464. Not every user will want to do this however, and for these people upgrading the BASIC ROM is probably a smart move. Remember though that this upgrade is purely concerned with Locomotive BASIC and does not affect the machine's ability to communicate with disc drives.

The code required to handle discs is called AMSDOS (AMStrad Disc Operating System) and is also stored on a ROM. Unfortunately, the only way to obtain it is to purchase a DDI-1 disc drive from Amstrad. The chip is not available separately due to the usual copyright laws. Although this is undoubtedly something of a marketing con by Alan Sugar, it does at least have one advantage - CPC disc software can be standardised using just one disc format. This probably isn't much consolation to those forking out for DDIs, but if you were able to use a 3.5" unit as your first drive, you would be denied access to the large existing base of disc software. On a more practical level, without a DDI-1 the 464 does not have the necessary 2nd drive connector (required by 3.5" and 5.25" mechanisms) which supplies the relevant power and electronic decoding. Take heart in the fact that DDI-1s can now be bought for as little as £70!

Q

Do you (or anybody else) know where I can get the AMX Mouse & Interface on its own? I think my copy of 'Art Studio' may be somewhat easier to use with a mouse than with a keyboard! Also, can you tell me where I can obtain an 'Expansion Port Double'? (I think that's what it's called) because I've got a 464+Multiface+64K RAM and disc drive hanging off the back of my machine, and sometimes I can't get the computer to read or write to the disc unless I remove the Multiface. One last thing, can I use your little picture store program? I am thinking of starting a PD library and I am intending to draw the menu page using Art Studio and then CALL it when I need to. I've been trying for ages to store and view screens! I'd be most grateful.

Stephen Matthews, Kings Lynn, Norfolk

A

Unless you're seriously into 'Cubism' a mouse is an essential computer artist's accessory. MJC Computer Supplies (0462 481166) will be only too pleased to send you the necessary hardware for £34.95. As for your overcrowded expansion port, an easy solution doesn't spring to mind. I guess the problem occurs because of the DDI-1's deficiency in the old through-connector department. The best solution is to use a special cable sold by Maplin Electronics that enables extra peripherals to plug in after the disc interface.

CAL

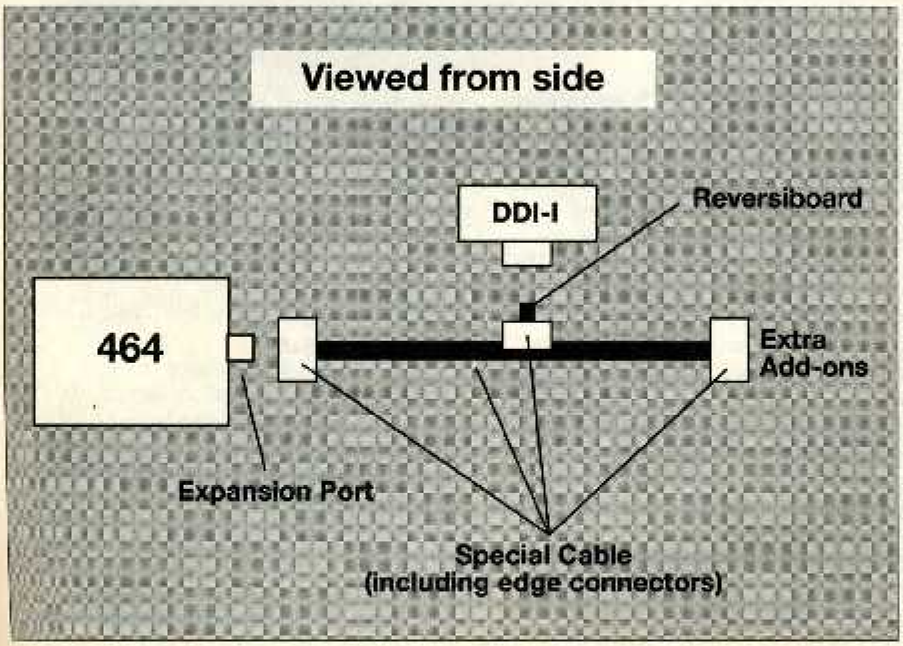
A

Insert the cable into the expansion port, plugging the DDI-1 into the connector situated midway along the cable's length. A 'reversiboard' will be required to allow the two edge connectors to mate properly. Finally, plug the 64k Ram expansion and Multiface into the other end of the cable. Hopefully this should cure your problem. If the symptoms persist then a more serious device conflict or power supply problem is to blame. Maplin catalogues are available from W.H.Smiths etc., see Amstrad/Disc/Interface Cable FD24B and Reversiboard GD37S.

As for your second point, feel free to use the picture store program. I have to admit that for such a small amount of code it really does come in incredibly useful. For anyone who missed its last public airing, here's the listing one more time:

```
10 FOR n=24550 TO 24574:READ
a:POKE n,a:NEXT
20 view=24550:store=24559
30 DATA
&f3,33,0,96,17,0,192,&18,8,&f3,33,0
40 DATA
&c0,17,0,96,0,0,1,0,64,&ed,&b0,&fb,&c9
```

After running it, type CALL STORE to store whatever is on the screen. When you wish to retrieve it type CALL VIEW.



Q

Is it possible to wire up a 3" disc drive taken from a PCW to my CPC 464? If so, any help would be gratefully received.

Paddy Smith, Liverpool

A

In theory, yes. The actual 3" drive mechanism employed by Amstrad is fairly standard across their range of machines. The problem occurs because your 464 is not already equipped with the necessary disc drive interfacing circuitry/software in the shape of a DDI-1 (see answer to Bruce Gaston). With this unit attached, wiring up an extra 3" drive is relatively straightforward - requiring a couple of simple logic chips and a cheap power supply (better safe than sorry). Getting hold of your PCW drive's pin-out connections might be tricky but these can always be worked out by hand. Sadly this is all a bit academic until you purchase a DDI-1. C'est la Vie!

WP Q&A

Q

I've tried centering double-width text on Protext, but the only way I can get it to happen is by trial and error. Is there a foolproof method, or something I've missed in the manual?

John Bradshaw, Gosport

A

There are two ways you can do this; the first is simple and is probably something you've missed when reading the manual. Use a decimal command to define lengthened characters, >0C 27 14 for 'on', and >0C 27 20 for 'off'. Don't use embedded commands. Enter a character width instruction immediately after the 'on' which should be double that or pica (or elite), i.e. >CW 24 or >CW 20. Centre text using the >CT formatting command only. Following the line to be printed, double-width should be switched off and then character width returned to normal with >CW 12 or >CW 10 - whichever is appropriate.

The second method is also simple; use embedded commands to define double-width characters - centre the line using CONTROL-C and note which column the middle of the text falls on. Now, using the delete key, move the text to the left until the last character is on that centre column. When printed, this line will be exactly the same distance to the right of centre as it is to the left!

PROGRAMMING Q&A

Q

I recently attended an entertaining student lecture entitled 'An introduction to fractals'. I was particularly impressed by the computer-generated images and wondered if anything along these lines could be produced by my 464. I can cope in BASIC but don't know much assembler, and C doesn't mean anything to me! I've almost bought a couple of books on the subject but found that they were all filled with maths and didn't contain any listings. Any help would be appreciated and I am sure other readers might be interested.

Crispin Chung, Nottingham

A

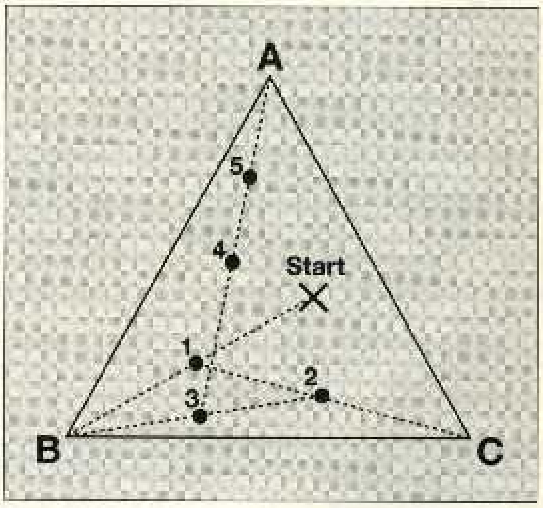
The short answer is yes, though it does depend on the particular pictures you've seen and how ambitious you are. For those readers who weren't able to attend your lecture here's some brief background info on these mathematical marvels.

Fractals are essentially shapes that exhibit enormous complexity and self-similarity. As fractal images are magnified, the same shapes occur on massively different scales. Imagine measuring a length of a stretch of coastline using a set of dividers to take in all the twists and turns. If the exercise is repeated with the dividers set to half their original spacing, the total measured length will increase as more detail of the nooks and crannies is incorporated. One might think that the overall length will continue increasing until it eventually settles on the true value. In fact, this does not happen. The length increases to infinity as more and more detail is measured by the narrowing dividers - rather strange for a finite strip of coast.

This concept of infinite irregularity was first expressed mathematically by Benoit Mandelbrot working at the IBM Research Centre in the USA. Mandelbrot coined the term 'fractal' to describe shapes of fractional dimensionality. The idea of varying dimensions is best illustrated by a ball of string. From a distance, the ball appears as a point, with zero dimensions. Closer up it fills more space - three dimensions. Closer still, the individual strands are visible; positions on the thread can be specified as the length along the thread - only one dimension. At some point as you move towards or away from the ball, the 'dimensionality' of your view changes. The end result is that mind-bogglingly intricate shapes can be expressed using just a handful of numbers. Now this may all seem a tad abstract but fractals become far more accessible through the use of computer graphics. When coupled with existing techniques, fractals can produce some amazingly realistic images of natural phenomenon including landscapes, clouds, trees, mountains and water - 'objects' which cannot be rendered using conventional methods due to their sheer intricacy. In addition, fractals are proving to be invaluable in modelling the structures of lungs, intestines, DNA and the transmission circuitry for the electrical activity of the heart. Michael Barnsley of Iterated Systems has pioneered an ingenious way of using fractals to compress real-time video images, thus enabling them to be transmitted over standard telephone lines, paving the way for 'videophones'.

Mandelbrot published his ideas in the 'Fractal Geometry of Nature'. Along with 'The Beauty of Fractals' these books contain many stunning colour fractal images, but give very little practical advice on how to create them yourself. Admittedly, many of the programs would be extremely complex and far beyond the scope of the 8-bit machines, but there is no reason why CPC users shouldn't explore the fundamental principles using BASIC. The pictures may not be as spectacular as a 3D mountain range shrouded in mist, but they are nonetheless impressive, especially considering their small size.

For our first example, visualise (or draw) an equilateral triangle. Now pick any spot in the triangle at random. Select, again at random, any one of the three vertices. Plot a point half way between the starting spot and the vertice. Choose another vertice and plot a point half way between the previous point and the new vertice. Repeat this final step a few dozen times. The diagram below illustrates the procedure:



In this example, the vertices chosen were B, C, B, A, A. What would you expect the inside of the triangle to look like after plotting a hundred points? A mass of random dots? Perhaps. Run the program below to find out.

```
10 MODE 2:INK 1,17
20 x=310:y=200
30 x(0)=160:y(0)=50
40 x(1)=460:y(1)=50
50 x(2)=310:y(2)=350
60 PLOT x,y
70 n=INT(RND*3)
80 x=x+(x(n)-x)/2
90 y=y+(y(n)-y)/2
100 GOTO 60
```

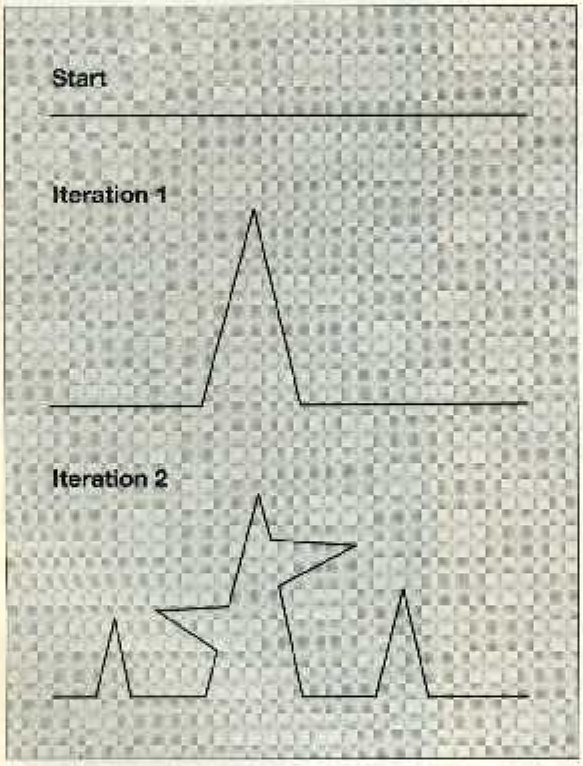
The resulting image on your screen should possess an unexpected symmetry

and mathematical perfection. The number of 'child' triangles visible is limited only by the screen resolution and the precision of the CPC's arithmetic. This shape, known as a Sierpinski Triangle is a simple fractal, it contains an infinite number of triangles.

By adapting this process, a similar, but much more interesting, image can be produced - the famous Sierpinski Fern.

```
10 MODE 2:INK 1,19
20 p(0)=0:p(1)=0.2:p(2)=-0.15:p(3)=0.85
30 q(0)=0:q(1)=-0.26:q(2)=0.28:q(3)=0.04
40 r(0)=0:r(1)=0.23:r(2)=0.26:r(3)=-0.04
50 s(0)=0.16:s(1)=0.22:s(2)=0.24:s(3)=0.85
60 t(0)=0:t(1)=0:t(2)=0:t(3)=0
70 u(0)=0:u(1)=1.6:u(2)=0.44:u(3)=1.6
80 a(0)=10:a(1)=80:a(2)=150:a(3)=1000
90 j=INT(RND*1000)
100 FOR n=3 TO 0 STEP-1
110 IF j<a(n) THEN k=n
120 NEXT
130 x1=(p(k)*x)+(q(k)*y)+t(k)
140 y=(r(k)*x)+(s(k)*y)+u(k)
150 x=x1:PLOT (x*50)+250,y*30
160 GOTO 90
```

The fern's more complex structure stems (no pun intended) from the use of affine transformations, a simple but powerful mathematical method.



Time for another diagram. Start with a straight, horizontal line. Now replace it with a preset spike-like shape, see 'Iteration 1' diagram. Having done this, replace every straight line in the diagram with the same spike shape, rotating and scaling it as necessary, to achieve a good fit. The 'Iteration 2' diagram illustrates the result. Repeat the process a large number of times.

The following program automates the whole procedure by employing a powerful recursive algorithm:

```
10 MODE 2:INK 1,22
20 DIM x(16),y(16),d(16)
30 x(0)=50:y(0)=50:x(1)=590:y(1)=50:d(0)=5
40 n=0
50 GOSUB 100:n=n+3
60 IF d(n)>0 THEN GOTO 50
70 n=n-3:MOVE x(n),y(n)
80 FOR p=1 TO 4:DRAW x(n+p),y(n+p):NEXT
90 IF n=0 THEN END ELSE n=n-1:GOTO 50
100 xd=x(n+1)-x(n):yd=y(n+1)-y(n)
110 x=xd/50:y=yd/50
120 x(n+4)=x(n+1):y(n+4)=y(n+1)
130 x(n+1)=x(n)+(15.666*x)
140 y(n+1)=y(n)+(15.666*y)
150 x(n+2)=x(n+1)+x-(20*y)
160 y(n+2)=y(n+1)+y+(20*x)
170 x(n+3)=x(n)+(17.666*x)
180 y(n+3)=y(n)+(17.666*y)
190 d=d(n)-1
200 FOR a=n TO n+4:d(a)=d:NEXT
210 RETURN
```

A 2D fractal forest should 'grow' in front of your eyes. By altering the starting shape (generator) and the shape that is repeatedly mapped onto it (replicator) a whole menagerie of images can be created, including Koch flakes, dragon and Hilbert curves.

Hopefully these three examples will have inspired you to find out more about this fascinating subject. Here's a list of some useful books on the topic:

The Fractal Geometry of Nature
Benoit Mandelbrot, WH Freeman & Co

The Beauty of Fractals
H O Peitgen & P H Richter, Springer Verlag

A Random Walk Through the Fractal Dimension
Brian Kaye, VCH

Q

I have recently bought "Easydraw.2" and I am impressed by the ease with which it enables one to produce diagrams and text. Unfortunately I cannot get it to print! I am using an Amstrad 6128 plus with a Star SG10 printer. Can you help?
John A R Hughes, Dundee.

A

The Star SG10 printer is not truly Epson compatible, but uses similar commands. You will need to change line 26040 to read as follows.

```
26040 PRINT #8,CHR$(27);CHR$(121);CHR$(32);CHR$(3);:REM Dual Density Graphics with Double Speed. SG10 Printer.
```

and line 26020 to

```
26020 PRINT #8,CHR$(27);"3";CHR$(2);:REM Set the line feed to 2/144". SG10 Printer.
```

This should give you good printouts of your masterpieces. The two lines above are the lines which would need to be changed for other printers. If you have any problems with Easydraw.2 or any enhancements please drop a line to me, you could be mentioned on this page.

Q

Could you please help me sort out the listing of "TRIG" by D. A. Juchau. I have typed this in on my CPC 464 and find that I cannot get past line 2010, as it always shows "Syntax Error in line 2010". I have enclosed a listing of the line in question.

```
2010 TAG:MOVER -36,4,3:PRINT "A2";:MOVER 4,-4:MOVER ((s*s3/2)-16),-8,2:PRINT "S3";:MOVER-((s*s3/2)+16),8
```

Mr C. E. Armstrong, Nottingham.

A

The syntax error here is due to additions to the BASIC language introduced when the 664 and the 6128 ROM were produced. This line will work perfectly with the 6128 machines but not on the 464. The problem is that the command MOVER has three values following the keyword whereas the 464 ROM only accepts two values - the x and y positions. The third value is the colour of the pen for the printed string "A2". The remedy for the 464 is quite simple you will be pleased to know. You must change all the keywords MOVER which have three values to the keyword PLOTR throughout the listing. Line 2010 for the 464 would be

```
2010 TAG:PLOTR -36,4,3:PRINT "A2";:MOVER 4,-4:PLOTR ((s*s3/2) -16),-8,2:PRINT "S3";:MOVER-((s*s3/2)+16),8
```

PLOTR does place a dot at the position but at least you should be able to get the program working.

NOTES to contributors of listings. For compatibility across the CPC range please avoid the following keywords as they are unique to the 6128 or suggest alternatives.

COPYCHR$
DEC$
CLEAR INPUT
CURSOR
FILL
FRAME
GRAPHICS
MASK
MID$=
MOVE X,Y,P or MOVER X,Y,P
ON BREAK CONT

Q

I own a 1991 Amstrad 6128 Plus and a Amstrad DMP3000 printer. I have constant problems with type-ins and I thought all my problems were solved when the proofreader program was listed in April but unfortunately I am having problems with this as well. I have typed in the proofreader twice with the same result, when I run the program all lines are checked and OK'd but then the machine resets itself to - f1 for Basic and f2 for Burnin' Rubber. I would also like to get the fish tank simulator up and running but get a "Type mismatch in 70" error message. I have enclosed the listing for both these programs. Please can you help?

Fishtank line 70

```
70 LOCATE 15,15:PRINT "Polite Notice:":ON BREAK GOSUB 380:MEMORY 17663:mem=17664:FOR g=1 TO 14:chk=0:FOR h=1 TO 77:READ a$:a=VAL("&"+a$):POKE mem,a:chk=chk+a:mem=mem+1:NEXT: READ chk$:IF VAL("&"+chk$)<>chk THEN PRINT "error in line";30+(g*10):STOP
```

George Maskham, Co.Dublin

A

I have looked at your listing of the proofreader and cannot find anything wrong. The addresses of the printer (&BD2B) and the screen (&BB5A) are those documented in the CPC 464, 664 and 6128 firmware guide and as far as I am aware the Plus series is no different. Has anybody else had problems with the proofreader?

The problem with the fishtank simulator is simpler but unfortunately I can only guess what is wrong as you have not included the data lines. The line at 70 reads the data from all the DATA statements and POKES the numbers into memory, so some part of your data is incorrect. My suggestion would be to check what is read in by printing it to the screen, you will then be able to see the last piece of DATA before the error and search the listing. You need to change the POKE mem,a to PRINT g;" ";a$: and run the program, this will list out all the data with the line of data, i.e. 1 01 1 01 1 0 1 1D and then 2 0 2 04 etc the 1 and 2 refers to the 1st line of DATA at 90 and 2nd line at 100. When the error message appears you will have the last legal piece of DATA on screen with the DATA line helping you to discover the problem.

NOTE: If you are sending in programs which you have typed in from the magazine please send a disc or tape with your program on it so the error can be corrected if possible. To receive your discs or tapes back please enclosed a stamped self-addressed envelope for the correct weight.

Q

I have almost completed writing a simple accounting program written in BASIC on my 464, with small amounts of machine code. Although intended for my personal use I am becoming increasingly interested in releasing it as PD, shareware or as a commercial package. However, before embarking on one of these three options I first need your help to polish my program a little. How can I disable the CTRL+SHIFT+ESC reset, and ensure that shiftlock is off and capslock is on? Also, 'old' keystrokes often appear automatically in my INPUT statements, can I avoid this? - T. Weston, Bath

A

Try the following:

POKE &bdee, &c9	turns reset off
POKE &bdee,&c3	turns reset on
POKE &b4e7,0	turns shiftlock off
POKE &b4e7,&ff	turns shiftlock on
POKE &b4e8,0	turns capslock off
POKE &b4e8,&ff	turns capslock on

N.B. the final four pokes are 464 only.

Finally, try 'flushing' the keyboard buffer just before executing an INPUT statement by using CALL &BB03. Be warned that this has a side effect of disabling the ESCAPE function so be sure to include a way out of your program!

TIPS

Here is a short program which demonstrates XOR graphics. When a line is drawn using the XOR mode (PRINT CHR$(23)+CHRS(1)) and drawn again in the same place the original background is displayed. This program draws a pattern on screen, updates the pattern 5 times and then removes the pattern and starts again. It's like magic.

```
10 REM XOR Display by Glynne Davies
20 DEFINT a-z
30 INK 0,0:BORDER 0
40 MODE 0
50 LOCATE 5,6:PEN 1:PRINT "XOR GRAPHICS"
60 LOCATE 5,19:PEN 13:PRINT "CPC ATTACK!"
70 PRINT CHR$(23)+CHR$(1):REM XOR GRAPHICS
80 INK 14,21:INK 15,3:REM Stop Flashing colours
90 WHILE trip=0:REM Endless loop press ESC to stop.
100 x=10:y=(y+40) MOD 400
110 FOR n=1 TO 640 STEP x
120 c=(c+1) MOD 15:MOVE n,y:DRAW 640-n,400-y,c
130 NEXT:REM Every 5 times the screen will clear
140 WEND
```



NEXT MONTH

CPC ATTACK!

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No, 'cos as of next issue we'll have implemented most of the changes you were screaming out for. The rest (the ones we haven't made) are still being thrashed out and we'll have more news as it happens. You're always welcome to write in with your views at any time to the letters pages. They may not always be published, but we do read everything, yunno.

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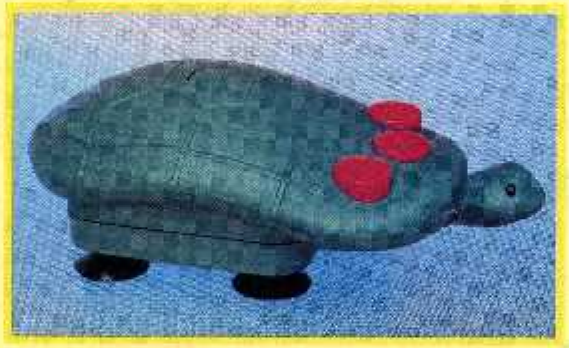
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